Illustrated Manual of

PART I

NEUROLOGICAL
Reflexes/Signs/Tests

PART II

ORTHOPEDIC
Signs/Tests/Maneuvers

For Office Procedure

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PART I

NEUROLOGICAL REFLEXES/ SIGNS/TESTS

Gratefully dedicated to all physicians

who believe the pursuit of knowledge

does not stop with the acquisition of a diploma

Preface

The purpose of this publication is threefold, first an attempt has been made to standardize some of the more commonly known and generally used neurological office procedures that can be performed without the use of highly sophisticated equipment or complicated actions; the criterion for such standardization has been the consensus of opinion of the various texts listed as Selected References. Second, to provide a quick and ready means of information relative to testing various functional and anatomical pathologies. Third, to motivate the professional, by providing such a list, to direct attention to other procedures which may be helpful in determining the site and extent of a neurological lesion.

To be sure, this work shows but a small part of the material available for such a publication, indeed, the field of neurology as a science in the healing arts is second only to that of pathology; but a considerable effort has been made to present major reflexes, signs and tests as they relate to being purposeful, relatively simple and in the neurological realm. To avoid redundancy in such a task has been especially difficult. Anyone who has ever undertaken to look up, for example, the many reflexes having a Babinski or a Bekhterev prefix or the numerous signs of Graves' disease could readily determine that were they all included, this book would easily be overextended.

Other criteria was used to limit the amount of examination methods listed; the reality of frequency of use, where the pathology is so rare in such an unlikely candidate, e.g. Grunfelder's Reflex, served to eliminate a considerable amount.

In addition, a sizable part of the deep (tendon) reflexes was not given with the rationale being when established reflexes served the same purpose as those lesser known, it was pointless to insert dozens more. Also responsible for non-inclusion was the inability to properly illustrate or explain a particular method or procedure.

In the end perhaps I have another purpose in presenting this work, that being to devise some way of getting the student and the physician to attempt something new, something useful or just plain something else. If I can succeed in this, even in a small degree, then I am gratified and my effort was worthwhile.

To my many undergraduate and postgraduate students and colleagues who have shared their time and understanding with me over the many years, I am eternally grateful. My special thanks go to Dr. Stanley Kaplan for his invaluable help and time which he freely provided along with his office staff; to Dr. Paul Lombardi and Debbie Moore.

John M. Mazion

Contents

Figure 1

ABADIE'S: Sign

Procedure: Squeezing the Tendo Achilles elicits no pain.

Significance: Is a manifestation of objective sensory disturbance seen in Posterior (dorsal) Column lesions of the spinal cord which carries the sensation of deep pressure. The sign is commonly seen in Tabes Dorsalis (Fig. 1).

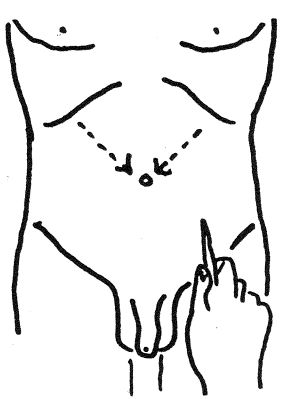


Figure 2 A

Figure 2 B

ABDOMINAL: Reflex

Procedure: This superficial reflex is taken by running an object with a blunt end, e.g. an orange stick or a broken

tongue blade, along the upper and lower abdominal quadrants (beneath the costal margins and above the inguinal ligament) on either side going medialward from lateralward. Pressure should be firm enough to indent the skin as the stroke is carried along, but not enough to separate, cut or cause discomfort to the cutaneum. Commonly there is a division into the "upper abdominal reflex", (Fig. 2 A) with innervation from thoracic nerve roots 7, 8, & 9; and the "lower abdominal reflex", (Fig. 2 B) with innervation from thoracic nerve roots 10, 11, & 12.

Significance: (see superficial reflexes) Integrity of nerve fibers from segmental levels T7 to T12.

Synonym: Superficial Abdominal Reflex.

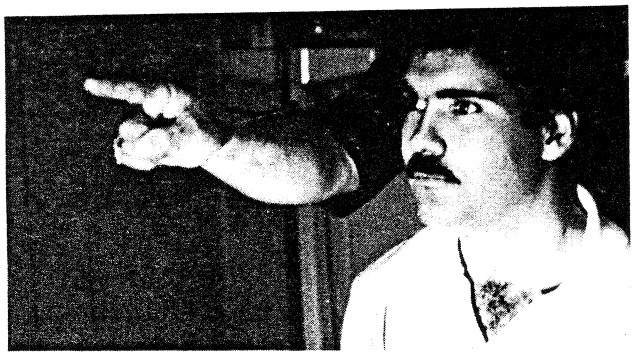


Figure 3 A

pupils dilated

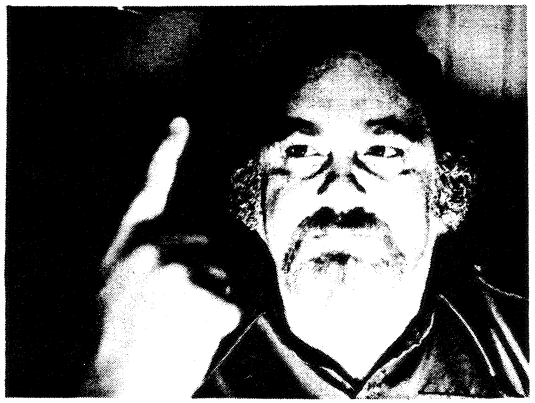


Figure 3 B

pupils constricted

ACCOMMODATION: Reflex

Procedure: While observing pupil size, the examiner first asks the patient to look directly ahead at a fixed object twelve or more feet distant (Fig. 3 A), then to look at an object such as the examiner's finger held approximately 12 to 14 inches in front of the patient slightly off to one side (Fig. 3 B) to prevent the patient "looking through" the near object and continuing to gaze at the distant object. The examiner notes the size of the pupils as they change (accommodate) from distant to near vision, the complete act consisting of an increased lens convexity, convergence of the eyes and constriction of the pupils.

Significance: Inability of the pupil to change size from larger (far vision) to smaller (near vision) indicates either motor interruption of ciliary ganglionic fibers from the oculomotor nerve to the sphincter muscle or abnormal stimulation of

nerve fibers from the sympathetic supply to the dilatator muscle of the iris.

Synonym: Near Reflex

Figure 4 A

Figure 4 B

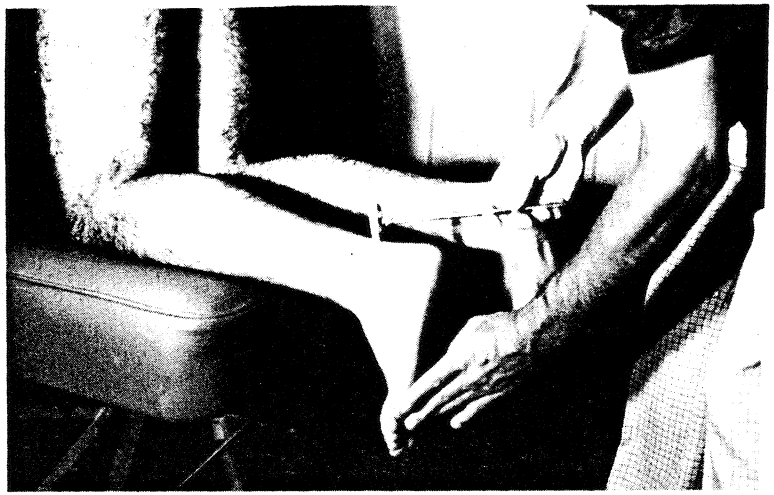


Figure 4 C

ACHILLES: Reflex

Procedure: The examiner while holding the foot at right angles to the tibia (plantigrade position) strokes the Tendo Achillis at its point of maximum response which is on an anterior posterior plane bisecting the apex of the internal malleolus to elicit plantar flexion of the foot. By this means the examiner can monitor the reflex both via tactile and visual discrimination (Figs. 4 A, B & C).

Significance: (see deep reflexes) Integrity of those branches of the tibial nerve containing fibers from the first and second sacral nerve roots.

Synonyms: (Tendo) Achillis Reflex; Triceps Surae Jerk; Ankle Jerk.

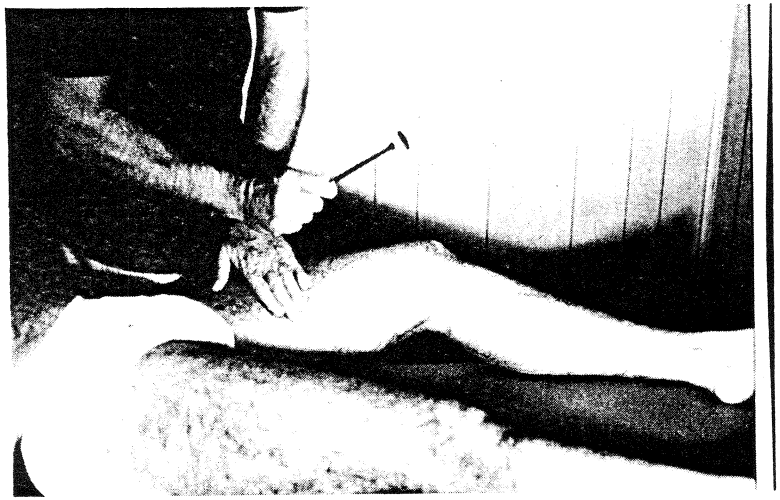


Figure 5 A

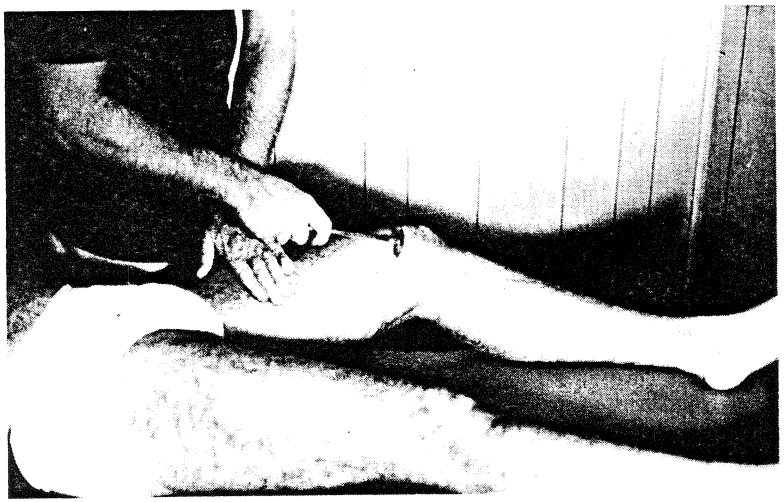


Figure 5 B

ADDUCTOR: Reflex

Procedure: With the patient supine and the thigh in abduction, the examiner taps the tendon of the Adductor

Magnus (Fig. 5 A) to elicit contraction of the Adductor muscles (Fig. 5 B).

Significance: A tendon reflex testing the integrity of L3 and L4 divisions of the Obturator Nerve.

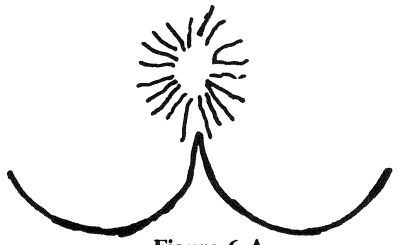


Figure 6 A

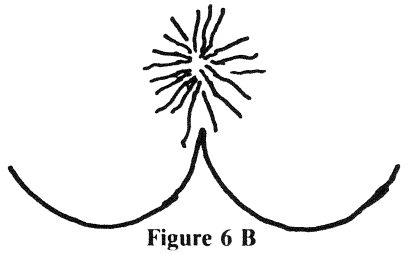


Figure 6 B
response to pinprick

ANAL: Reflex

Procedure: Contraction of the external anal sphincter is elicited in response to scratching, pricking or otherwise irritating the neighboring skin (Figs. 6 A & B).

Significance: Testing the integrity of nerve fibers from the 4th and 5th sacral segmental levels.

Synonym: Perianal Reflex

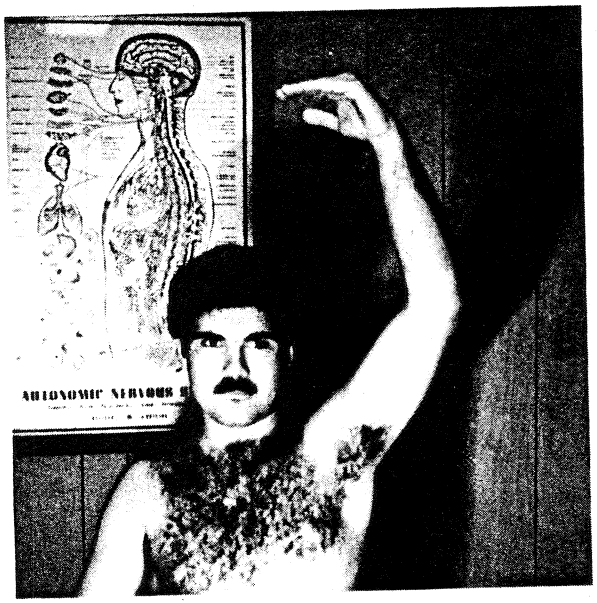


Figure 7 A

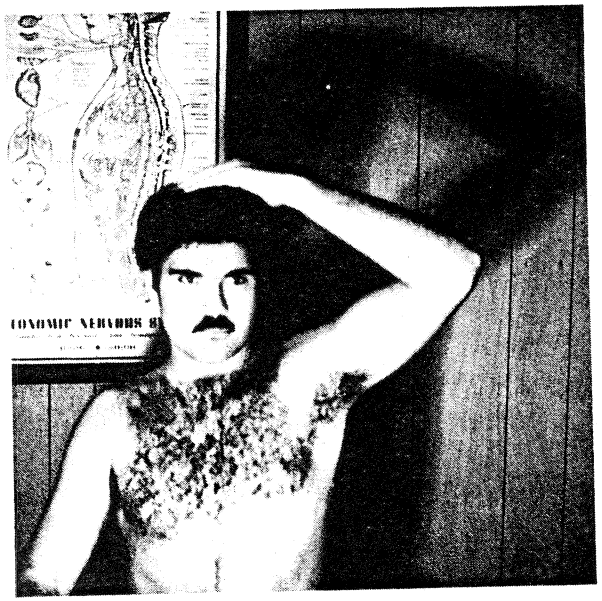


Figure 7 B

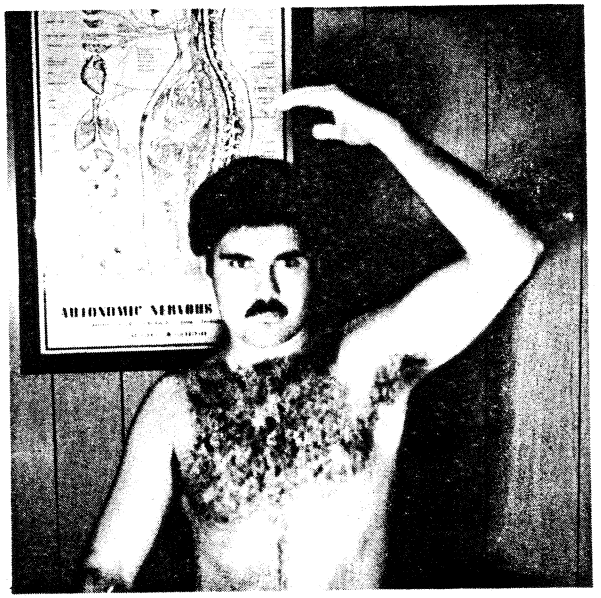


Figure 7 C

ANDRE-THOMAS: Sign

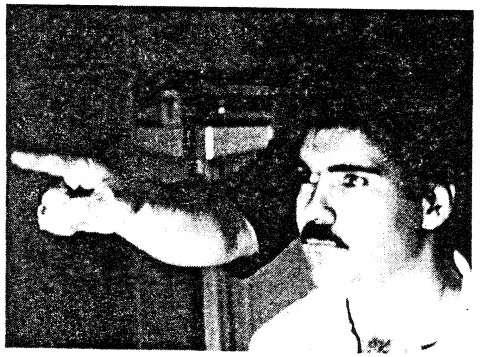
Procedure: The patient during the finger-to-nose test is directed to raise the upper limb high above his head (Fig. 7 A), and then suddenly told to let his arm fall to his head (Fig. 7 B). When the sign is present the arm rebounds (Fig. 7 C) from being dropped to the head.

Significance: Asthenic manifestation of the delay in starting and stopping muscle movement seen in cerebellar lesions.

Figure 8 A

small irregular

pupils unchanged by light
Figure 8 B



pupils dilated by distance
Figure 8 C

ARGYLL ROBERTSON PUPIL: Sign

Typical: Small (miotic), contracted, irregular and often unequal pupils (Fig. 8 A) that fail to react to light either directly or consensually is the primary feature. The pupils also respond poorly, if at all, to painful stimuli or mydriatics and respond with retention or even exaggeration of the accommodation-convergence reflex, although the latter may be difficult to see due to the already contracted pupillary state. The sign is usually bilateral and there is no defect in vision (Figs. 8 B & C).

Atypical: Unilateral, dilated and no reaction to accommodation.

Significance: Abnormalities of the pupils are found in diseases involving the Oculomotor nerve, this type is particularly seen in Syphilitic degeneration of the central nervous system (Tabes Dorsalis) and is almost always indicative of Neurosyphilis. Remotely, Encephalitis, Multiple Sclerosis, a midbrain tumor, chronic Alcoholism and Diabetes have been encountered. An atypical Argyll Robertson pupil sign with isolated loss of the light reflex has been described in trauma of the eyeball and orbit, in Diabetes and Syringomyelia.

Figure 9 A

Normal Response
Figure 9 B

Arroyo's Sign
Figure 9 C

ARROYO'S: Sign:

The pupillary reaction to light in an otherwise normal eye, is sluggish or delayed (asthenocoria) when compared with a promptly responding normal pupil (Figs. 9 A, B & C).

Significance: A condition of asthenocoria seen in Hypoadrenalism.

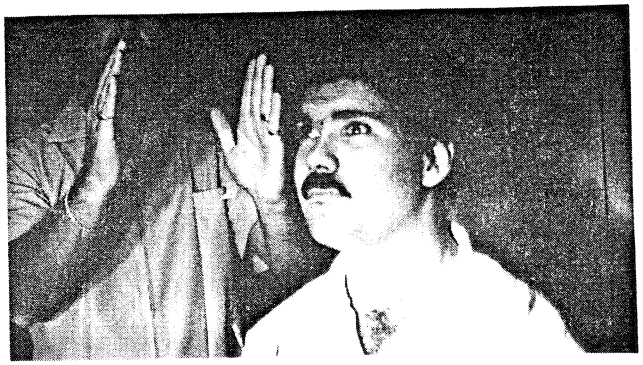


Figure 10 A

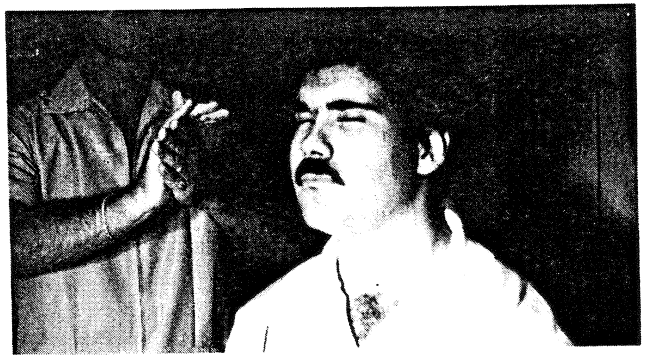


Figure 10 B

AUDITORY: Reflex

The prefixal word for any reflex being caused by stimulation of the Auditory Nerve, e.g. sudden loud sound causing a rapid, single, bilateral blinking of the eyes (Auditory Palpebrae) or a sudden loud unexpected sound causing the pupils to widen (Auditory Pupillary) (Figs. 10 A & B).

Significance: The reflex is of no particular diagnostic significance other than audition may or may not be intact and the reflex may be used as evidence in malingering when loss of hearing is alleged.

Figure 11 A

Figure 11 B

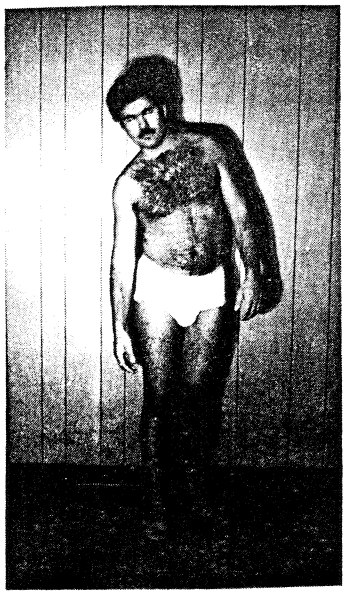
BABINSKI: Reflex/Sign

Procedure: With the patient supine, the plantar surface of the foot is stroked directly and firmly with any instrument having a dull edge or point, e.g. an orange stick, directed from the heel to the metatarsophalangeal joints (Fig. 11 A) testing both the inner and outer borders of the sole. The normal plantar reflex of the foot becomes extensor when the sign or reflex is elicited (Fig. 11 B) with the following being observed: dorsiflexion of the great toe with flexion and fanning out of the outer toes.

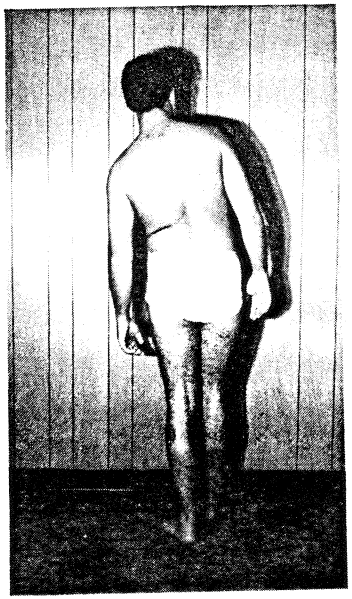
Care must be taken to avoid interpretation of a normal voluntary extensor toe response as a Babinski Sign; the characteristic Babinski reaction is one of slow, tonic digital movement and usually disappears after the stimulus is removed; that of a voluntary response is faster and associated with rapid withdrawal of the leg.

Significance: The sign is pathognomonic of corticospinal (pyramidal) tract disease, it is never present in normal subjects except in infants during the first six months of life. It is the most constant of the pathologic reflexes. (See Pronation and Platysma Signs)

Synonyms: Babinski Toe Sign; Toe Sign; Extensor Plantar Response



walking forward
Figure 12 A



walking backward
Figure 12 B

BABINSKI-WEIL: Test

Procedure: In a large, clear space the patient is made to walk forward and backward, approximately 7 to 9 steps, ten times each way with the eyes shut. The test is positive when the patient, deviating from a straight line, bends to one side when walking forward and then to the opposite side when walking backward (See Figs. 12 A & B).

Significance: Disease of the internal ear, notably osseous or membranous labyrinthitis.

Note: When the patient bends to the same side walking both forward and backward under the same circumstances it signifies a cerebellar lesion on the homolateral side.

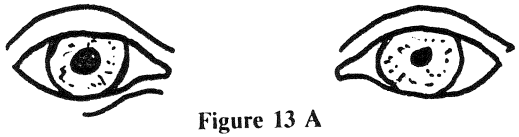


Figure 13 A

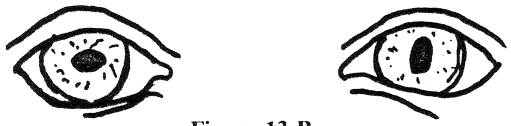
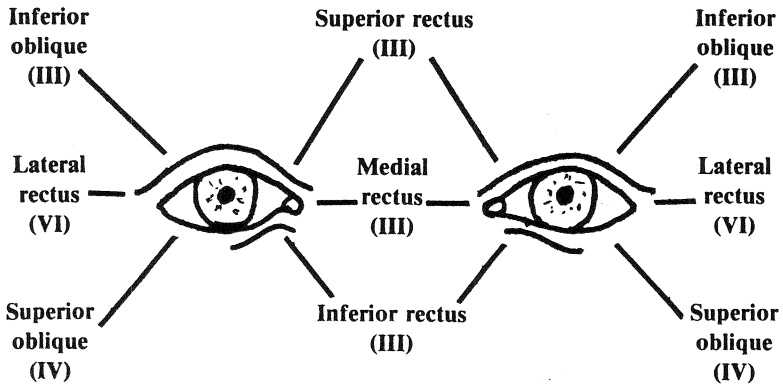


Figure 13 B

BAILLARGER: Sign

Unequal size (Fig. 13 A) and/or shape (Fig. 13 B) of the pupils associated with or a part of the Argyll Robertson Sign.

Significance: Dementia Paralytica (Syphilis of the central nervous system, particularly the brain).



THE CARDINAL POSITIONS OF GAZE

BALLET'S: Sign

Varying degrees of loss of voluntary movements of the globe including Ophthalmoplegia Externa (loss of all voluntary movement) with both pupillary and reflex eye movements spared.

Significance: Thyrotoxicosis (Graves' Disease), Hysteria and Hyperaldosteronism.

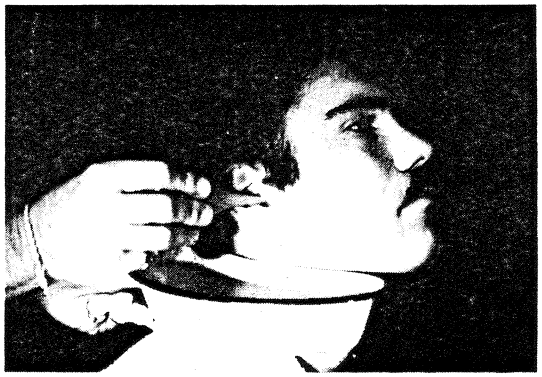


Figure 14 A

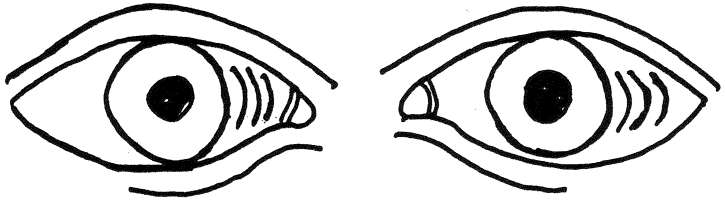


Figure 14 B

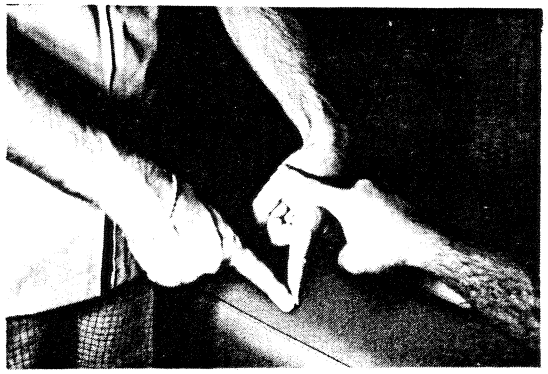


Figure 14 C

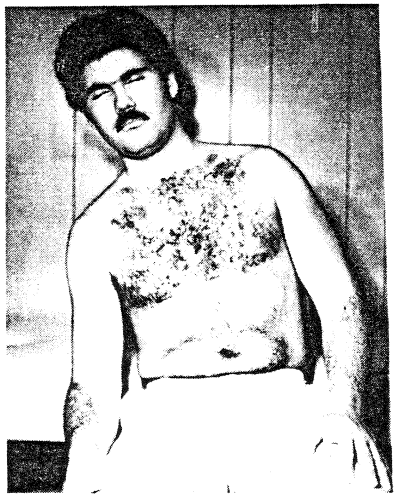


Figure 14 D

BARANY: Sign/Test

Tests by which the semicircular canals of the labyrinth are stimulated and responses (mainly true nystagmus and past-pointing) are recorded as normal or abnormal relative to the proprioceptive systems.

Procedure: The horizontal semicircular canals are tested by the patient sitting upright with the head extended backward 60 degrees; the vertical canals are tested by the patient's head flexed forward in the upright position. Initially the horizontal canals are tested by slowly injecting 100 cc. or approximately 3 oz. of water at about 63 degrees F. into the external auditory canal. The draining water is caught in a kidney basin placed under the ear (Fig. 14 A). The following then is normally observed:

1. Horizontal nystagmus to the opposite side (rapid component) (Fig. 14 B).
2. Verticle past-pointing to the same side (Fig. 14 C).
3. Postural deviation (falling) to the same side (Fig. 14 D).

Warm water of 112 degrees F. or flexion of the head to 30 degrees will normally cause a reversal of the above (1., 2. & 3.) although with cerebral tumors there may be a perversion (wrong side deviation).

Significance: Testing for normal Vestibular apparatus

Synonym: Caloric Test

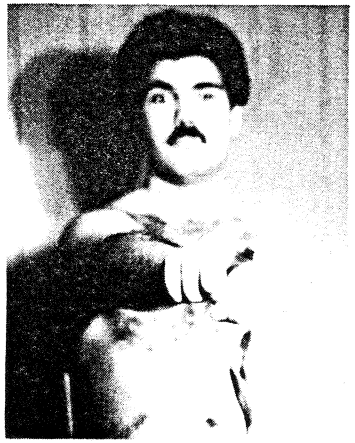


Figure 15 A

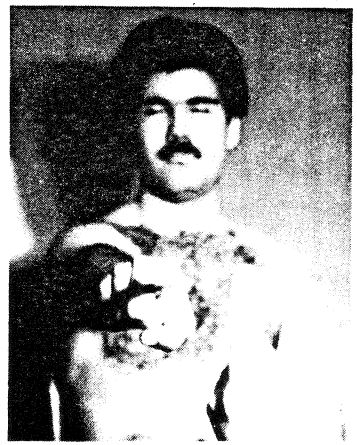


Figure 15 B

BARANY POINTING: Test

Procedure: The patient points at a specific fixed object alternately with the eyes open and then with the eyes closed several times (Figs. 15 A & B).

Significance: A constant error with the eyes closed indicates a brain lesion.

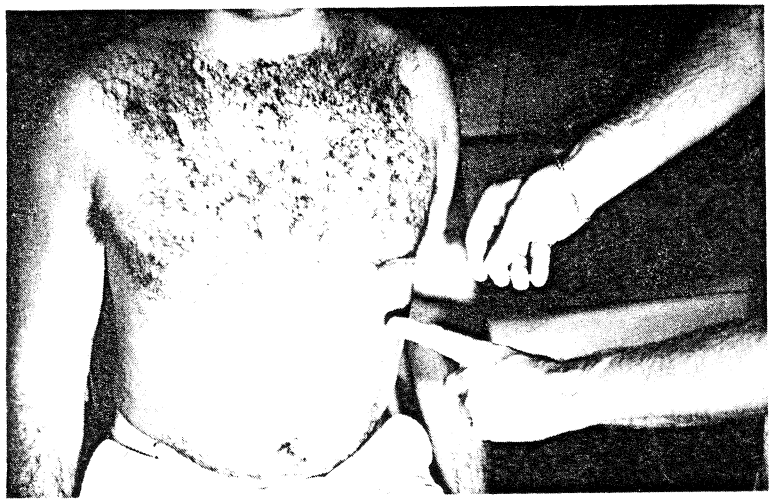


Figure 16

BARKMAN: Reflex

Procedure: Homolateral contraction of the Rectus Abdominis upon cutaneous stimulation just below the nipple (Fig. 16).

Significance: See Abdominal Reflexes ("upper abdominal reflex")

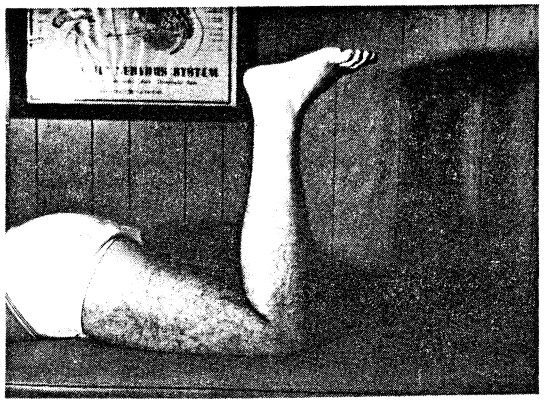


Figure 17 A

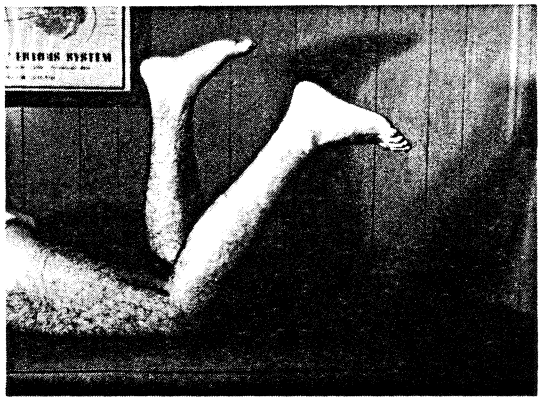


Figure 17 B

BARRE'S PYRAMIDAL: Sign

Procedure: The patient is placed in the prone position, the knees are flexed at right angles (Fig. 17 A). The sign is present when the patient cannot hold this position (Fig. 17 B).

Significance: Disease of the Pyramidal Tracts.

Figure 18 A

Figure 18 B

BEEVOR'S: Sign

Procedure: The patient from the supine position is asked to flex the neck, elevate the legs or sit up. The abdominal muscles are palpated and the umbilicus is observed. If there is equal strength in all four abdominal quadrants, the umbilicus will remain centered, will not move and the sign is not present. If any of the sides, upper, lower or lateral are weak or paralyzed, the umbilicus will move (Beevor's Sign) to the side opposite the weakness. The patient is asked to tense the abdomen, if the Transversus and Recti are paralyzed the abdomen tends to protrude and contraction cannot be palpated (See Figs. 18 A & B).

Significance: The sign is one of functional weakness or paralysis showing the inability of the patient to inhibit the

unopposed pull of the antagonistic abdominal muscles. The level of a spinal cord lesion is localized as the umbilicus is innervated by the 10th thoracic segment and all muscles caudal to T10 are paralyzed if there is a transverse spinal cord lesion at this level.

Synonym: Umbilical Migration Test

Figure 19 A

Figure 19 B

Figure 19 C - Normal

Figure 19 D - Bekhterev's Sign

BEKHTEREV (Bechterew): Sign(s)

Upper Extremity Pathologic Reflex (Figs. 19 A & B)

The patient, standing or sitting, strongly flexes and then relaxes both elbows. The affected forearm falls back more slowly and in a jerky manner, even when contractures are mild.

Pupillary (Figs. 19 C & D)
Dilatation of the pupil on exposure to light.

Significance: Sometimes seen in Tabes and General Paralysis.

Synonym: Paradoxical Pupillary Phenomenon (Paradoxical Pupil) (See Mendel-Bechterew)

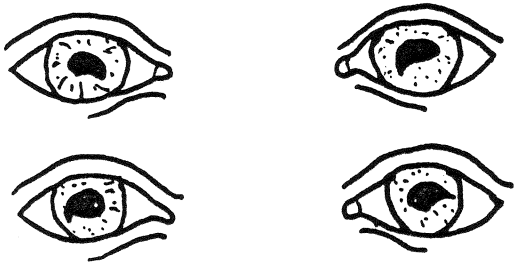


Figure 20

BERGER'S: Sign

Irregularly shaped, spherical or elliptical pupils (Fig. 20).

Significance: An infrequent early sign of Tabes, Dementia and certain paralyses.
(See Argyll Robertson Pupil)

Figure 21 A

Figure 21 B

Figure 21 C

BICEPS: Reflex

Procedure: With the patient sitting (optimum position), forearms resting on the thighs, elbows at an intermediate position, the biceps tendon is placed under slight tension by the examiner's thumb with the pad over the exact center of the tendon. With a percussion hammer the examiner produces a crisp stroke upon his thumbnail, observing and palpating flexion of the elbow and contraction of the Biceps

Muscle which normally results. (Figs. 21 A, B & C)

Significance: Primarily: To determine an upper and lower motor neuron lesion after comparing the quality of the response with the symmetrical counterpart;
Secondly: to ascertain the integrity of afferent and efferent fibers of the Musculocutaneous Nerve and its segmental center, C5-6.

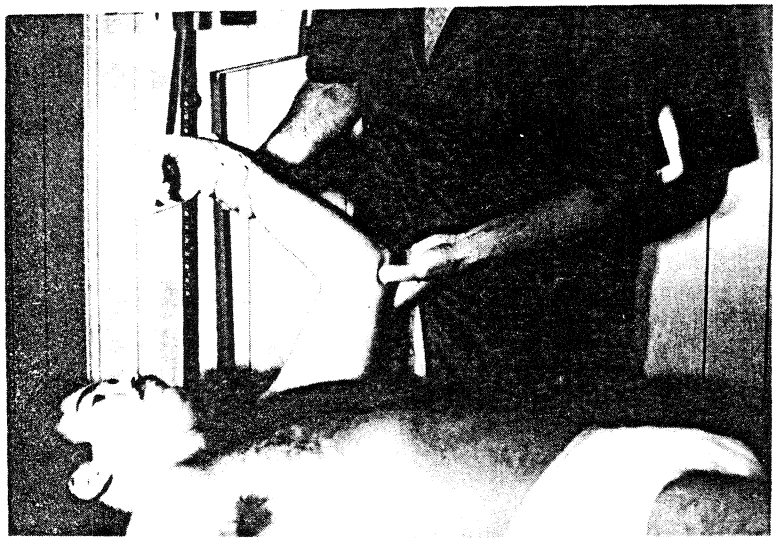


Figure 22

BIERNACKI'S: Sign

Loss of deep pressure pain when compression is exerted over the ulnar nerve behind the elbow (Fig. 22).

Significance: A lesion of tracts carrying deep pressure sensation, the Posterior Columns of the Spinal Cord, which many feel to be pathognomonic of Tabes Dorsalis.

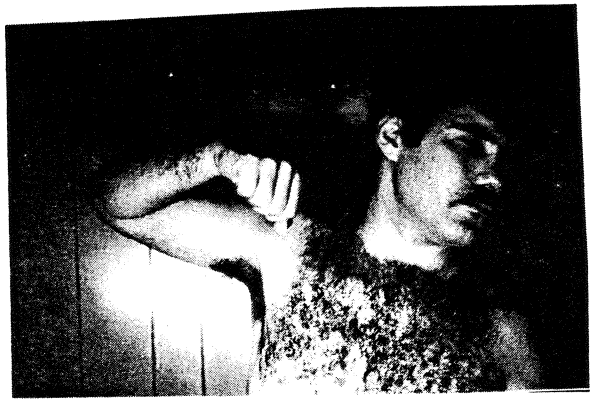


Figure 23 A

Figure 23 B

BIKELE'S: Sign

With the arm held upward and backward and the elbow fully flexed (Fig. 23 A), extension of the elbow meets with resistance and increases radicular pain (Fig. 23 B) from the cervico-dorsal region.

Significance: Brachial plexus neuritis or meningitis symptomatology because of the stretch put on the brachial plexus nerve roots or their covering.

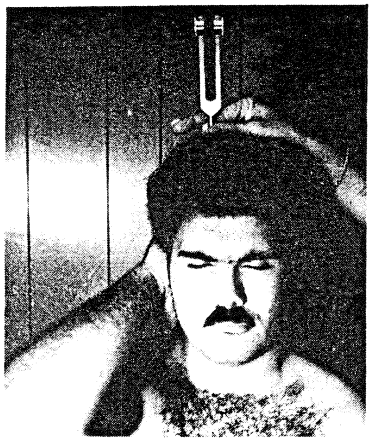


Figure 24 A

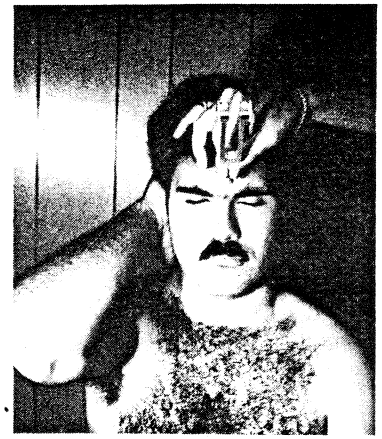


Figure 24 B

BING'S: Test

Procedure: Place a tuning fork (c-256 Hz) on the top (vertex) or crown of the patient's head and have the patient cover one ear, normally the closed ear hears sound best via bone conduction. If no sound is heard in the closed ear. nerve deafness is suspected and the test is positive (Figs. 24 A & B).

Figure 25

BLOCK-STEIGER: Test

Procedure: The examiner holds two vibrating tuning forks at

the same time before each ear of the patient with one tuning fork struck stronger. In a person with normal hearing, the louder fork only will be heard (Fig. 25).

Significance: Simulated deafness

Figure 26 A

Figure 26 B

BRACHIORADIALIS: Reflex

Procedure: The patient is seated, forearms flexed and resting on the thighs in the neutral position between pronation and

supination (thumbs up). The examiner, while palpating the belly of the Brachioradialis, strokes its tendon with a reflex hammer at its point of maximum response which is normally between the lower third of the forearm and the styloid process of the radius on the medial volar side. If this is a true brachioradialis stretch reflex, only flexion of the forearm will result while the examiner also gains quantitative response via paplation (Figs. 26 A & B).

Significance: To determine the afferent and efferent integrity of the Radial nerve through its segmental centers C5-6 relative to an upper or lower motor neuron lesion.

Pseudosynonyms: Periostealradial; Radial (reflexes); Suppinator Jerk

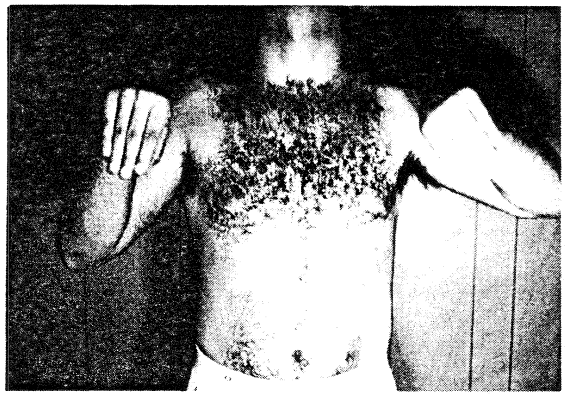


Figure 27

BRADBURNE'S: Sign

A bilateral sign of spinal cord damage between the fifth and sixth cervical segments resulting in a characteristic upper limb position of abduction of the arms, flexion of the forearms and external rotation; is also called "Thorburn's Position." (Fig. 27)

Significance: Acute stage of spinal cord contusion, compression or shock.

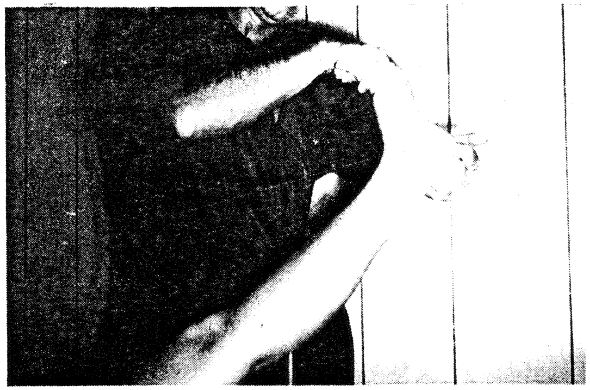


Figure 28 A

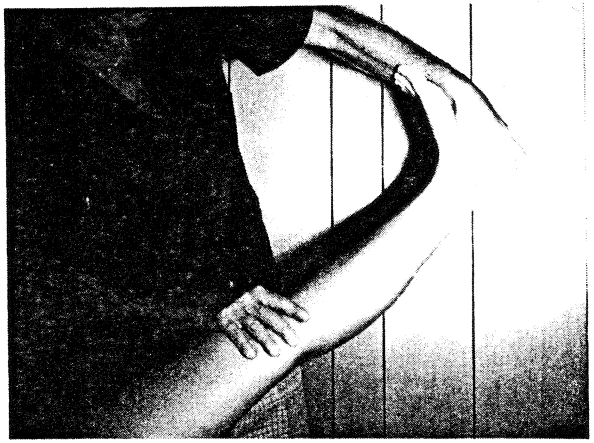


Figure 28 B

Strong Dorsiflexion e. g. Fig. 28 A or Fig. 28 B, added to straight leg raising

BRAGARD (BRAGGARD): Sign (Test)

Procedure: With the patient supine and both lower limbs straight and parallel, the whole lower extremity on the

affected side is flexed on the hip until the patient experiences pain, with the lower limb held in this position the foot is strongly dorsiflexed. The sign is positive if there is an increase in radicular pain (Figs. 28 A & B).

Significance: Peripheral or nerve root irritation

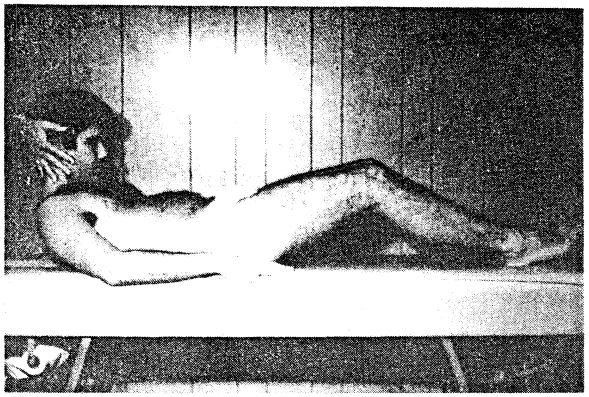


Figure 29 A

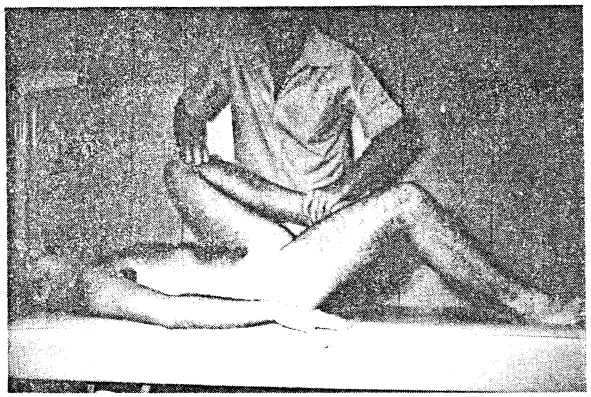


Figure 29 B

BRUDZINSKI: Sign

1. A somewhat inconstant sign occurring when forced flexion of the head and neck with the patient optimally supine

causes flexion of both legs at the knees and frequently also accompanied by flexion of the hips bilaterlly (Fig. 29 A)

2. Brudzinski's Contralateral Signs: With the patient supine, when one thigh is passively flexed at the hip, the opposite thigh makes a similar movement (Fig. 29 B)

Significance: Both are indications of Meningitis.

Figure 30 A

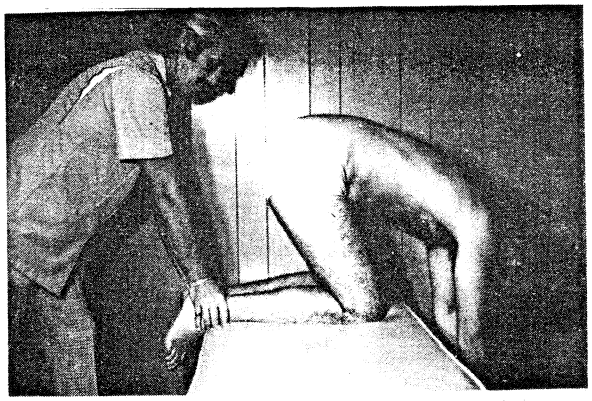


Figure 30 B

BURN'S BENCH: Test

Procedure: The patient kneels as far forward as possible on a

padded chair, table or bench (Fig. 30 A) approximately 18" high and is instructed to bend over and touch the floor with his finger tips while the examiner grasps the back of his ankles to keep the patient from falling forward (Fig. 30 B).

The Test is positive when any individual with or without backache and with functional integrity of the hips and knees, provided the patient is not debilitated by weakness, either refuses to make an effort to do it or performs part of it and then rises to the perpendicular stating he cannot do it. Patients may be expected to perform the maneuver which imposes no strain or pain on the following conditions: sciatic neuralgia, congenital anomalies, arthritis, specific spinal disease, e.g. tuberculosis or spinal compression fractures.

Significance: Evidence of malingering or hysteria.

Synonym: The Kneeling Bench Test

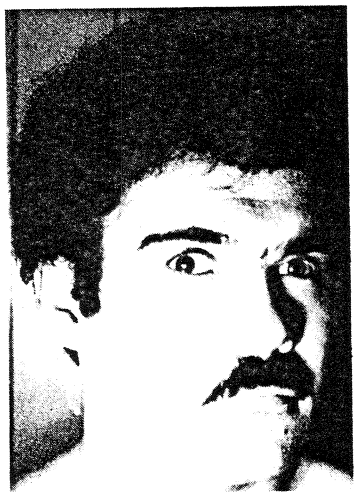


Figure 31 A

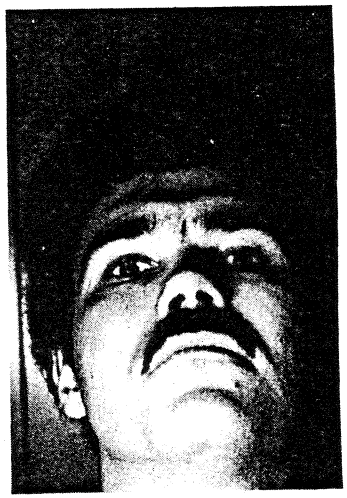


Figure 31 B

Doll's Eyes Movements

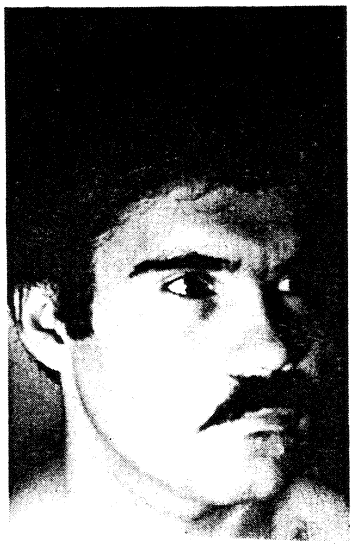


Figure 31 C

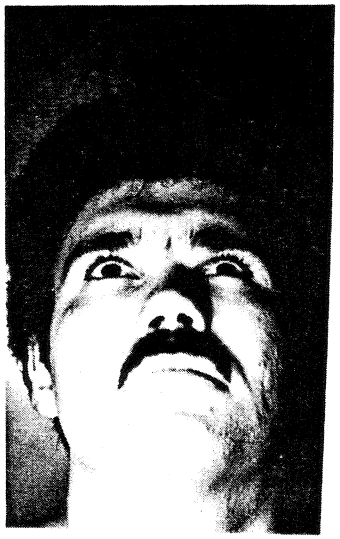


Figure 31 D

Cantelli's Sign

CANTELLI'S: Sign

The doctor tells the patient to keep looking at him and then moves the patient's head into different positions. Upon movement of the head there is dissociated movement of the eyes, normally lateral movement of the head causes opposite side rotation of the eyes, raising the head causes lowering of the eyes (Doll's Eyes Movements) Figures 31 A & 31 B. The sign is present when this reflex is lost.

Significance: Destruction of the Vestibular apparatus or its central connections (Medial Longitudinal Fasciculus), is a means of examining the unconscious patient to determine extensive involvement of brainstem connections III, IV, and VI.

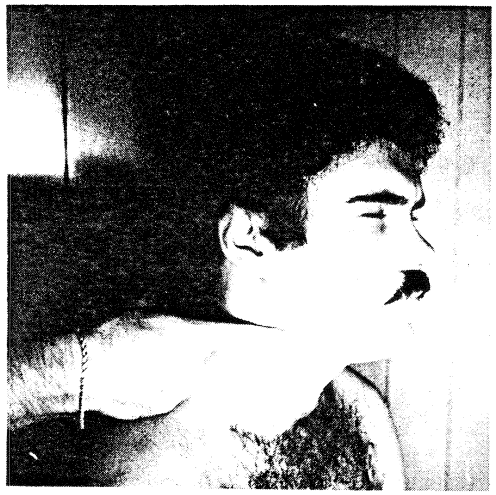


Figure 32

CAROTID SINUS: Reflex

Procedure: Pressure over the carotid sinus in the neck (at the level of the Carotid Artery bifurcation) produces slowing of the heart rate and a fall in blood pressure (Fig. 32).

Significance: This reflex is abolished with lesions of Cranial Nerves IX (afferent branch) and X (efferent portion).

The reflex is hyperactive in certain persons with vasomotor instability, e.g. cardiac disease, hyper or hypotension, etc. in which slight stimulation of this sort could produce fainting or worse.

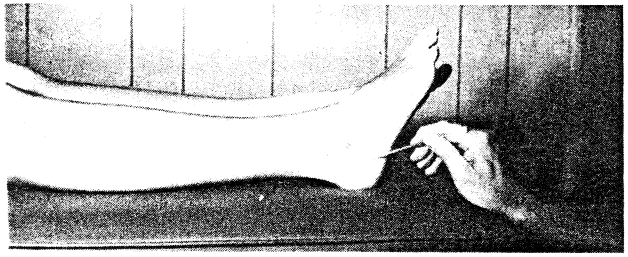


Figure 33 A

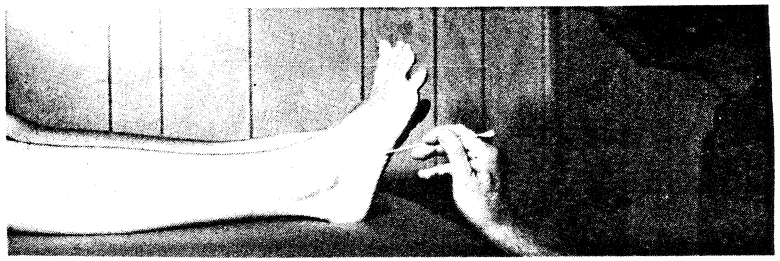


Figure 33 B

CHADDOCK'S: (Pathologic) Reflex/Sign

Stroking the lateral leg, behind and below the external malleolus with an orange stick or other blunt instrument produces the Babinski Toe Sign (Figs. 33 A & B).

Significance: An upper motor neuron lesion of the Corticospinal (Pyramidal) Tracts.

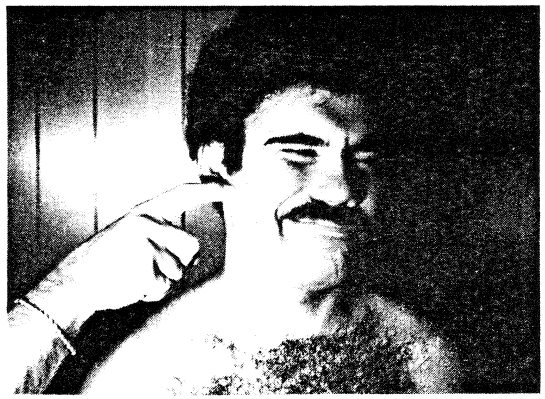


Figure 34

CHVOSTEK'S: Sign

Tapping the facial muscles over the parotid gland or Facial Nerve results in spasmotic contraction of the ipsilateral facial muscles (Fig. 34).

Significance: Hyperexcitability of the Facial Nerve due to Hypocalcemia (Tetany).

Synonym: Chvostek-Weiss Sign

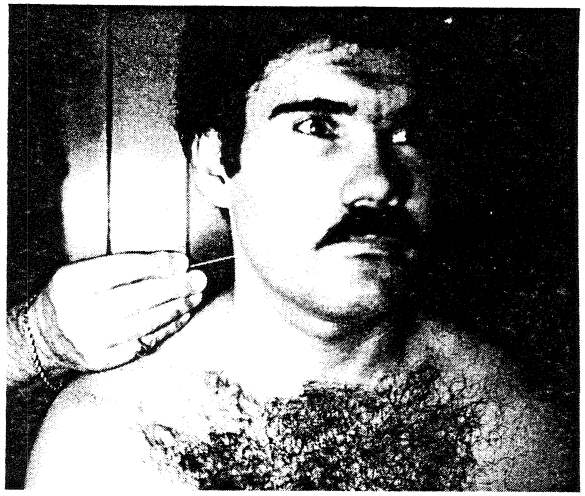


Figure 35 A

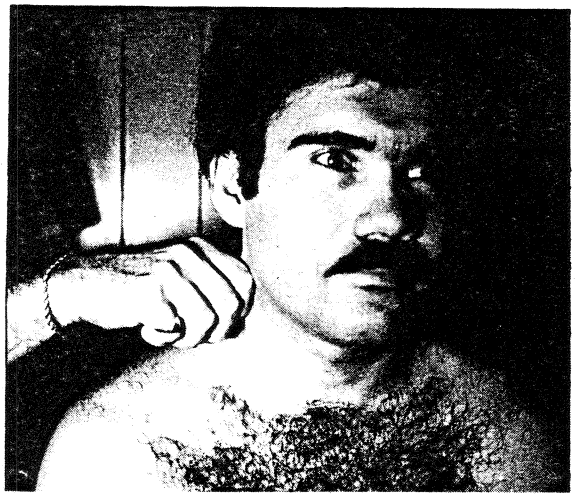


Figure 35 B

Figure C
Pupillary Dilatation

CILIOSPINAL: Reflex

Procedure: The production of painful stimulation of the skin of the neck such as sharp pinching, pin prick, etc., dilate the pupil (Figs. 35 A & B).

Significance: This reflex is dependent upon the integrity of the cervical sympathetics and is lost with their interruption (Horner's Syndrome).

Synonym: Cutaneous Pupillary Reflex

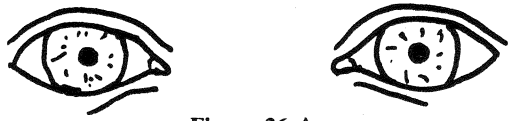


Figure 36 A

Figure 36 B

COCHLEOPAPILLARY: Reflex

A reaction of the iris (contraction, Figure 36 A, of the pupil followed by dilatation, Figure 36 B) to the production of a loud sound.

Significance: This reflex does not occur in deafness from Labyrinthine Disease.

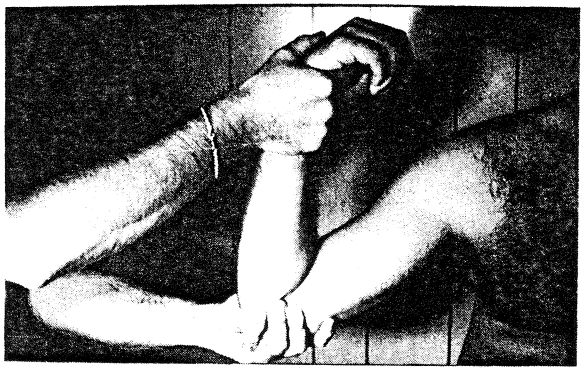


Figure 37 A

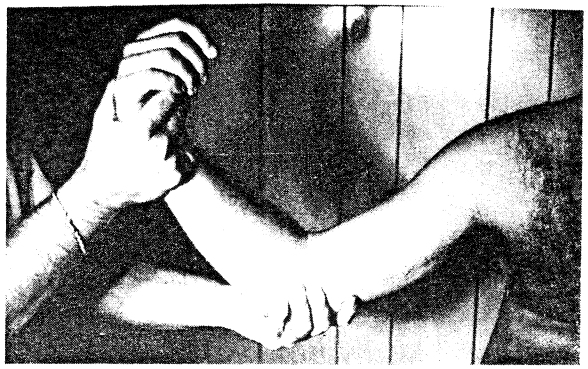


Figure 37 B

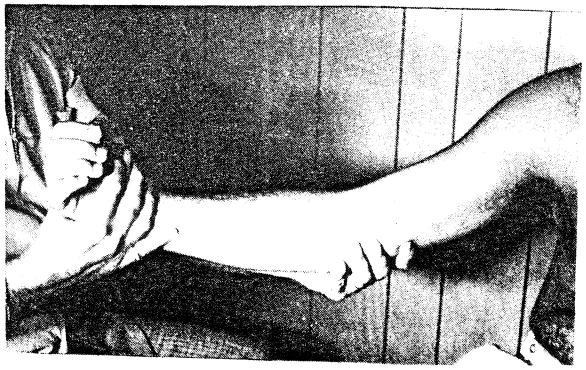


Figure 37 C

COGWHEEL: Sign

A rigidity of joint muscles (especially the elbows) in which passive motion elicits a movement which can be felt by the examiner as a series of catches and releases as if the muscles were being moved over a cog forming an irregular jerkiness. Is like bending a piece of clay, solder or lead pipe (lead pipe rigidity) (Figs. 37 A, B & C).

Significance: A lesion in the Extra-pyramidal System of the Basal Ganglia most notably Paralysis Agitans.

Figure 38 A

Figure 38 B

Direct Consensual

CONSENSUAL: Reflex

The reaction usually related to the eyes, whereby the same reaction in both eyes relative to stimulation by light or by touch is caused by a stimulus applied to either eye alone (Figs. 38 A & B).

Significance: See Corneal Reflex; Light Reflex

Synonym: Crossed Reflexes

Figure 39 A

Figure 39 B

CORNEAL: Reflex

Procedure: The patient seated, is asked to look up and away from examiner who, using a fine hair mounted on an applicator or a hair-like projection of a wisp of cotton, stimulates the cornea of the adducted eye by touching it directly and coming from lateralward in such a way that the object is not seen by the patient. The test is done bilaterally. Care must be taken to stimulate the cornea only, not the sclera and to keep the hair projection from the front of the pupil where it can be seen. The normal response consists of forceful and rapid contraction of the eyelids, directly and consensually (Figs. 39 A & B).

Significance: The sensory (afferent) portion of this reflex runs in the Trigeminal Nerve while the motor (efferent) portion producing the blink is carried by the Facial Nerve.

The pattern of responses of this reflex in the presence of the 5th or 7th nerve lesions is shown below, the lesion in each case being on the right side.

STIMULATION TO		CONTRACTION OF: Right Eye	Left Eye
Right V Lesion	(Right Cornea	0	0
	(Left Cornea	+	+
Right VII Lesion	(Right Cornea	0	+
	(Left Cornea	0	+

Note: The cornea is the projecting transparent dome covering the iris and pupil of the eye. It is covered in turn and

continuous with a delicate mucous membrane covering the exposed surface of the eye, the conjunctiva.

Synonyms: Conjunctival, Blink, Eyelid Closure & Lid Reflexes

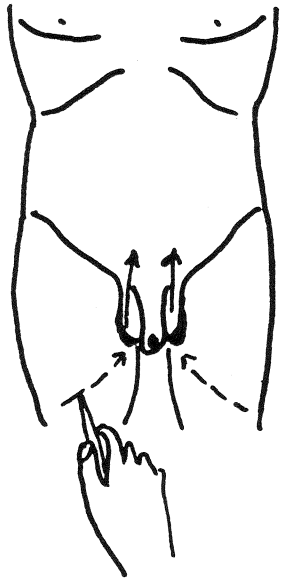


Figure 40

CREMASTERIC: Reflex

Procedure: The patient is standing, feet approximately 12'' apart and disrobed. Using a broken tongue depressor blade, the blunt pointed end of a reflex hammer, or a pin, the examiner strokes the skin of the proximal third of the thigh from the anterior midline medialward and upward, the length of the stroke being in the vicinity of 4 to 6''. The normal response is elevation of the testes on the same side (Fig. 40).

Significance: The reflex is lost by injury of L1 nerve roots (Femoral Nerve afferents and Genitofemoral Nerve efferents)

or damage to the ipsilateral Pyramidal tract at or above the 1st lumbar segment of the spinal cord.

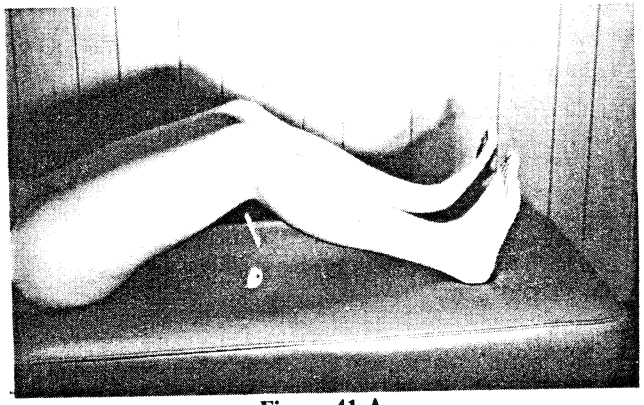


Figure 41 A

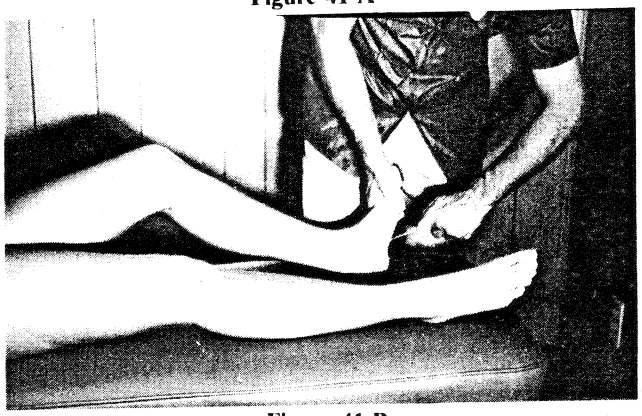


Figure 41 B

CROSSED EXTENSION: Reflex

Procedure: The patient is supine with both knees flexed and feet dorsiflexed (Fig. 41 A). By stimulating the sole of one foot by firmly stroking it with a blunt instrument as in the Babinski Pathologic Reflex the examiner elicits extension of the contralateral leg (Fig. 41 B).

Significance: A pathologic reflex due to corticospinal tract disease.

Figure 42 A

Normal

DALRYMPLE'S: Sign

A common neurological alteration associated with Grave's Disease (Hyperthyroidism) showing widened palpebral fissures (Fig. 42 A).

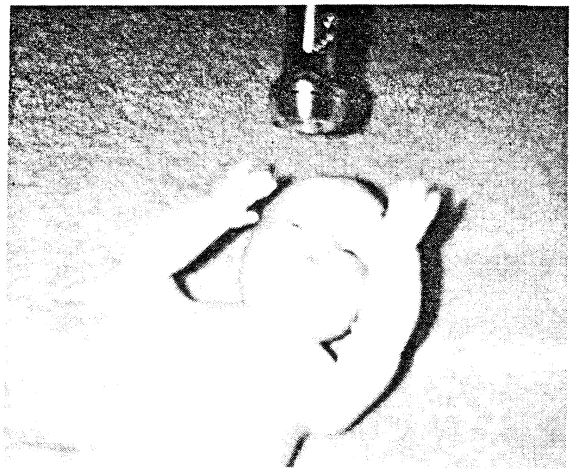


Figure 43

DAZZLE: Reflex

A reflex primarily for infants in which shining a strong light in the eyes will cause an immediate closing of the eyelids lasting as long as the stimulus is applied. Even if the infant's eyes are already closed the stimulus will cause increased contraction of the eyelids (Fig. 43).

Significance: Decreased or absent visual acuity.

Figure 44

DEJERINE'S: Sign

Coughing, sneezing and straining at defecation cause aggravation of radiculitis symptoms due to blockage of cerebral spinal fluid flow by a mechanical obstruction (Fig. 44).
Significance: A herniated or protruded intervertebral disk, spinal cord tumor, spinal compression fracture or anomaly. The course of the radiculitis identifies the level of the lesion.

Synonym: Dejerine's Triad

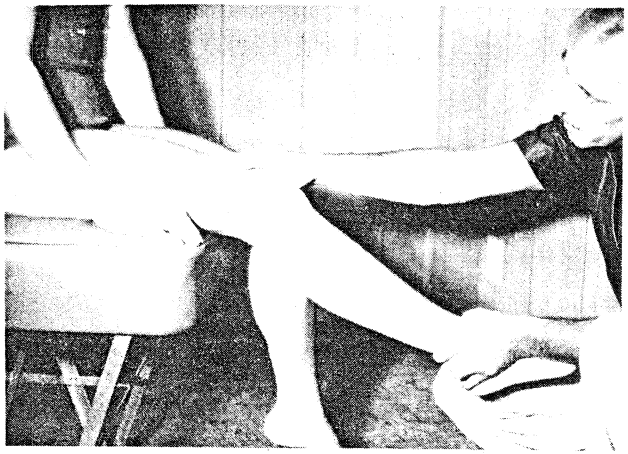


Figure 45 A

Figure 45 B

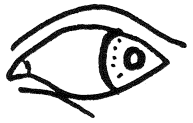
DEYERLE'S: Sign

Procedure: With the patient seated, the affected leg is extended passively at the knee to the point at which pain is reproduced (Fig. 45 A). The knee then is slightly flexed and strong pressure is applied manually by the examiner in the popliteal fossa (Fig. 45 B). The test is positive if radiculitis symptoms are increased.

Significance: The test shows irritation of the sciatic nerve above the knee caused by stretching the nerve over an abnormal mechanical obstruction.

Synonym: Popliteal Press Test

Inability to Adduct



Nystagmus

DISCONJUGATE GAZE: Sign

The sign is revealed when the patient shows bilateral inability to move the eyeball to the normal medial extreme (Bilateral Internal Rectus Ophthalmoplegia) while the opposite abducting eye exhibits nystagmus (cerebellar) during the attempt.

The sign may be reversed, e.g. bilateral inability to move the eye to the normal lateral extreme (Bilateral External Rectus Ophthalmoplegia) while the abducting opposite eye reveals nystagmus, with the same significance.

Significance: Internal Rectus Ophthalmoplegia signifies deficit of the Oculomotor Nerve while External Rectus Ophthalmoplegia indicates a lesion of the Abducens Nerve. The nystagmus relates mostly to cerebellar involvement and less commonly to brainstem pathology. Many consider the sign to be almost pathognomonic of Multiple Sclerosis.

Synonym: Bilateral Internuclear Opthalmoplegia Gase Palsy.

Figure 46 A

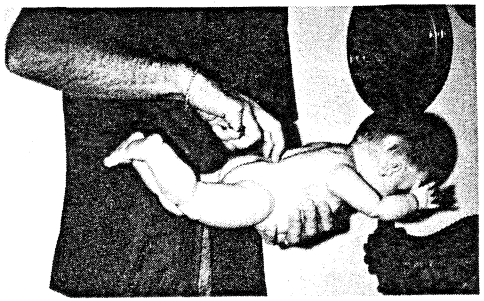


Figure 46 B

DORSAL: Reflex

Procedure: With the infant prone and supported by the examiner's hand beneath the trunk (Fig. 46 A), tactile stimulation of the skin over the normal thoracolumbar paravertebral zone with a firmly stroking finger produces contraction of the ipsilateral long muscles (Erector Spinae) of the back so that the spine extends with the head and legs curving around the stimulated area and the trunk moves away from the stimulus (Fig. 46 B). Most of the time both sides are stimulated at the same time.

Significance: Loss of this reflex signifies reduced motor activity such as in Wernig-Hoffman's Disease or other lower motor neuron problems.

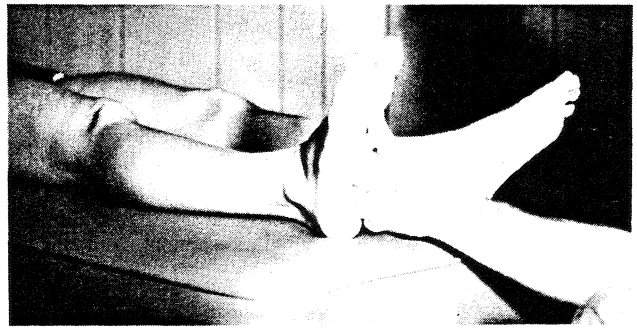


Figure 47 A

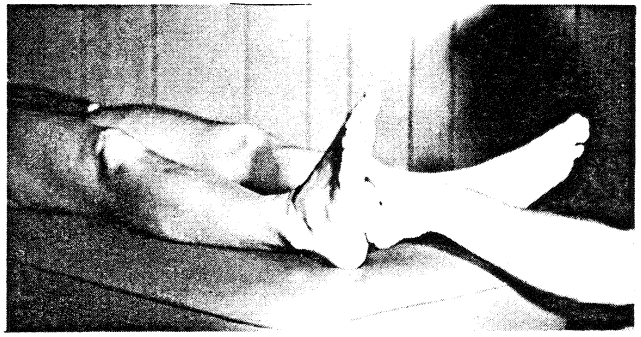


Figure 47 B

DUCHENNE'S: Sign

Procedure: The examiner pushes up (dorsally) the head of the 1st metatarsal with his thumb (Fig. 47 A), and asks the patient to plantar flex the foot. The sign is present when the medial border of the foot dorsiflexes with the lateral border plantar flexing (Fig. 47 B). The head of the first metatarsal offers no resistance to the pushing thumb, the plantar crease runs from the medial side of the big toe laterally to the heel and the arch disappears.

Significance: Paralysis of the Peroneus Longus due to a lesion of the Superficial Peroneal Nerve or a lesion at or above L4, L5 and S1 roots.

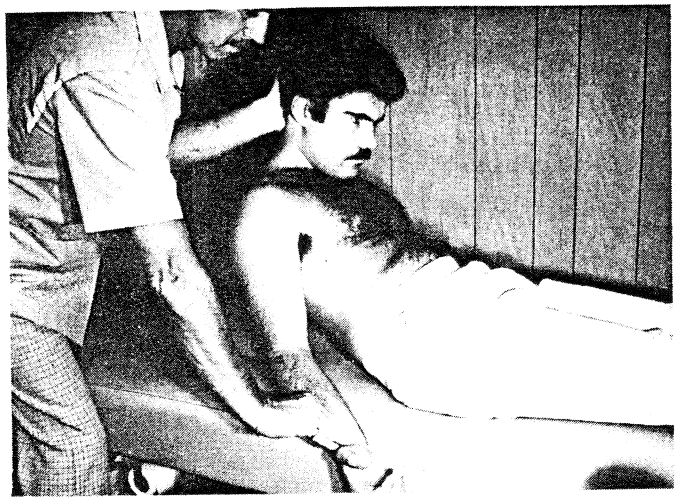


Figure 48

ERBEN'S: Reflex

Procedure: The examiner strongly bends the head and trunk of the patient forward into one large "C"-shaped curve while monitoring the radial pulse. The reflex is present when the pulse slows down (Fig. 48).

Significance: A sign of vagal irritability

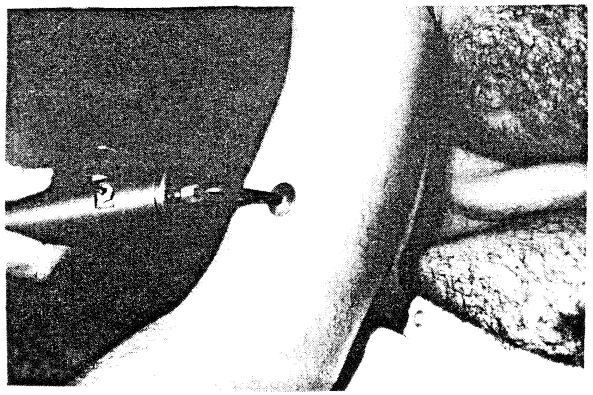


Figure 49

ERB'S: Sign

Application of galvanic current to a nerve or muscle motor point produces a tonic (tentanizing) muscle contraction instead of the normal, single "make" and "break" contraction (Fig. 49).

Significance: Hyperexcitability of a peripheral motor nerve as in Tetany.

Synonym: Tetanic Reaction

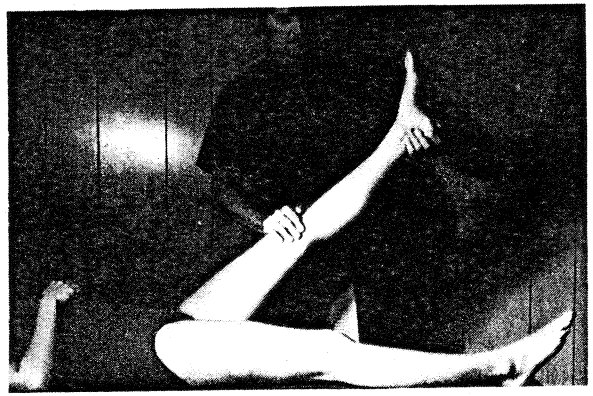


Figure 50 A

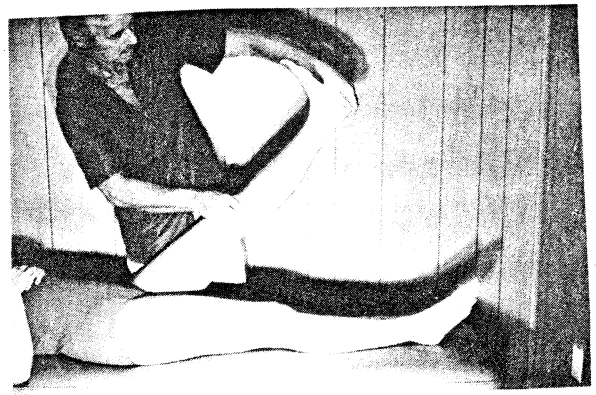


Figure 50 B

FAJERSZTAJN'S: Sign/Test

Procedure: In unilateral sciatica the examiner straight leg

raises the unaffected limb until it causes or increases the opposite side radiculitis (Fig. 50 A); if none is produced to this maneuver, strong dorsiflexion of the foot is added to the straight leg raising (Fig. 50 B). The production of radicular pain on the opposite side by either of these maneuvers is a positive test.

Significance: Sciatica produced at the nerve root level.

Synonyms: Well Leg Raising Test; Crossed Sciatic Sign.

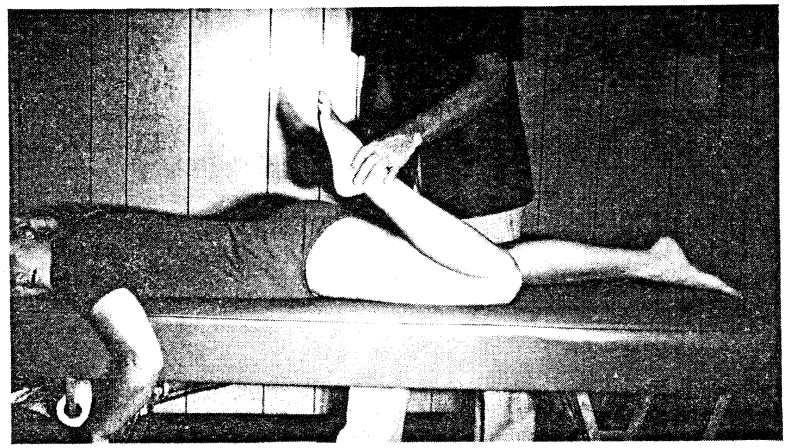


Figure 51

FEMORAL NERVE STRETCH: Test

Procedure: With the patient prone, the examiner without raising it, flexes the knee on the side of involvement in an attempt to touch the heel to the ipsilateral buttock. The test is positive when this maneuver produces lumbar pain or neuralgic anterior thigh pain (Fig. 51).

Significance: Lesions of the 3rd or 4th lumbar nerve roots.

Synonym: Nachlas Test (Orthopaedic)

Figure 52 A

Figure 52 B

FINGER TAPPING: Test

Procedure: The patient stands in front of the examiner. Both have thumb and index fingers approximated at eye level. The patient is instructed to watch the examiner's fingers and to duplicate the doctor's thumb and finger tapping movements with his own, in unison and bilaterally (Figs. 52 A & B).

Significnce: Good rhythm with the examiner or between the patient's own fingers cannot be maintained in Cerebellar Disease.

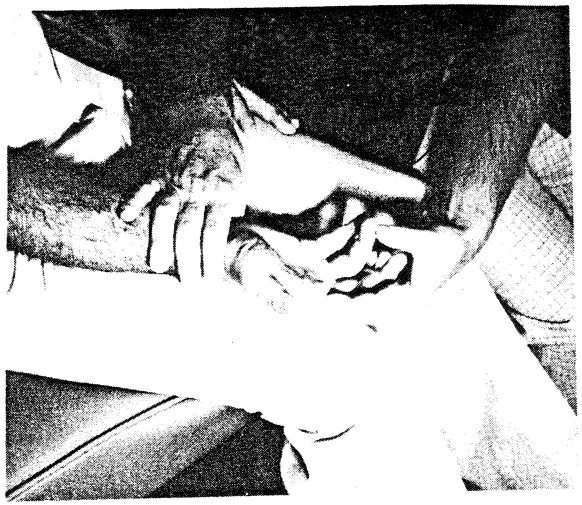


Figure 53 A

Figure 53 B

FINGER THUMB: Reflex

Procedure: The examiner gives firm flexion of the third to the fifth finger of each hand of the patient at the proximal joints (Fig. 53 A), thereby producing opposition and adduction of the thumb combined with flexion at the metacarpophalangeal

joint (Fig. 53 B).

Significance: The reflex is absent in patients with corticospinal lesions. When lost on one side it constitutes an important sign of a Pyramidal Tract lesion.

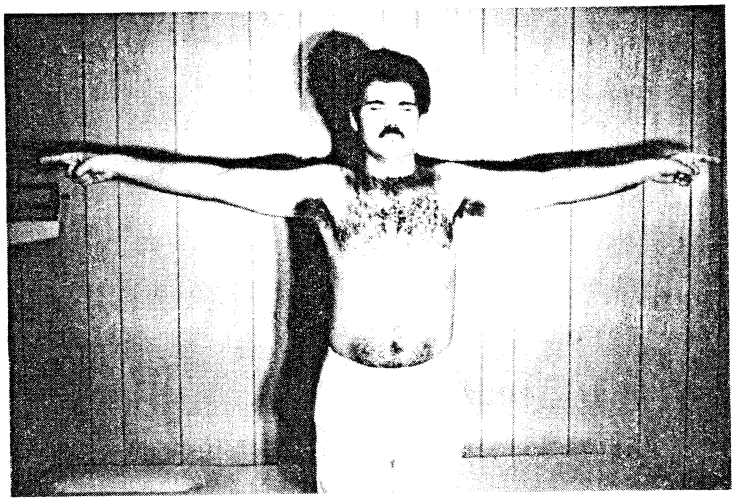


Figure 54 A

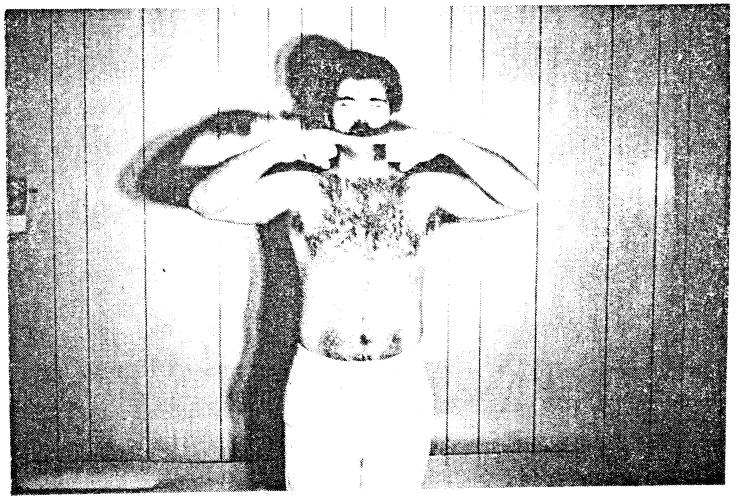


Figure 54 B

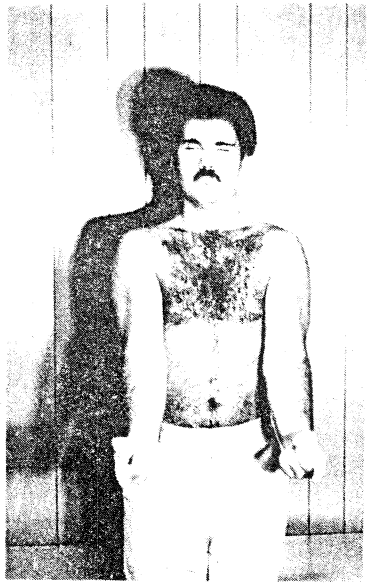


Figure 54 C

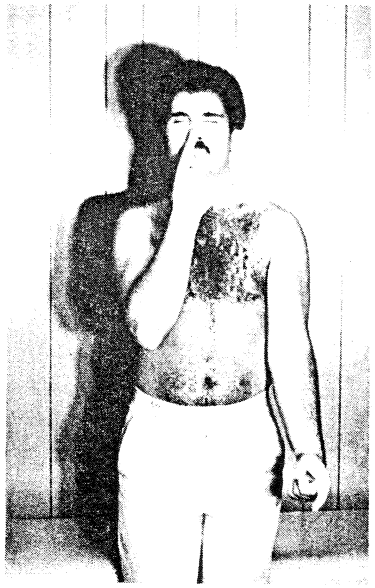


Figure 54 D

FINGER TO FINGER: FINGER TO NOSE: Tests

In the first test the patient attempts to approximate the tips of the index fingers after the arms have been outstretched (Figs. 54 A & B).

In the finger to nose test the patient places the tip of each index finger (alternating) to the tip of the nose from an extended arm position (Figs. 54 C & D). The tests are done both with the eyes open and closed.

Significance: Ability to accurately hit the mark with the eyes open but not with the eyes closed indicates Posterior Column Disease. Inability to hit the mark normally and in a coordinated manner either with the eyes open or closed indicates Cerebellar Disease.

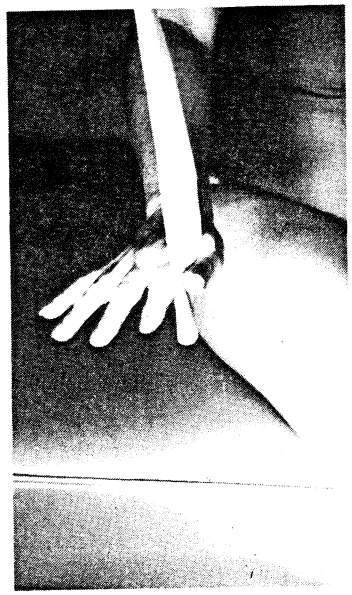


Figure 55 A

Normal

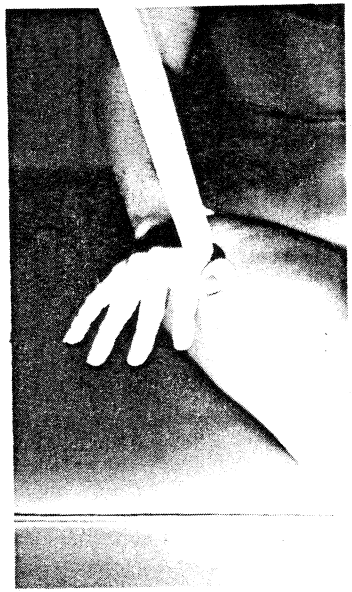


Figure 55 B

Froment's Sign

FROMENT'S: Sign

Procedure: The examiner places a piece of paper between the patient's thumb and index finger and instructs the patient to hold it between the two digits. Instead of merely bringing the two together (adducting the thumb and abducting the index finger) the patient flexes the interphalangeal joint of the thumb to compensate for paralysis of the Adductor Pollicis. (Figs. 55 A & B).

Significance: Ulnar Nerve Palsy

Synonym: Froment's Paper Sign

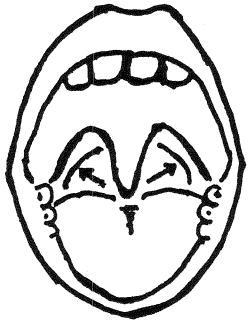


Figure 56 A

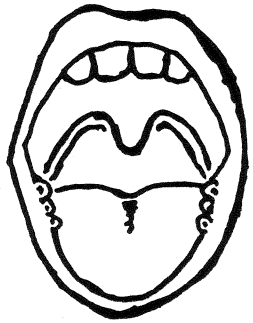


Figure 56 B

GAG: Reflex

Procedure: With the patient's mouth open, a tongue blade is touched against first one, and then the other pillar of the palatal arch (the constrictor muscle of the pharynx, Fig. 56 A). There occurs contraction and an elevation of the soft palate directly and consensually which is symmetrical and causes a normal retching or gagging response (Fig. 56 B).

Significance: Loss of this reflex indicates a lesion of the Ninth Cranial sensory component, the Tenth Cranial motor component or their medulla connection; rarely it may indicate hysteria.

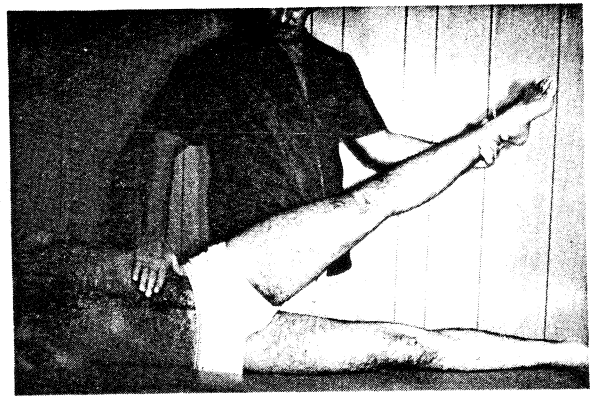


Figure 57 B

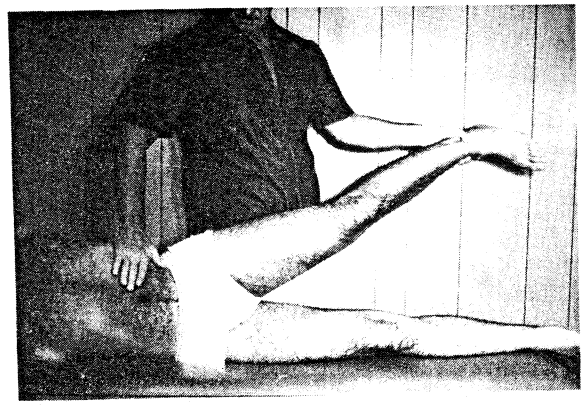


Figure 57 A

GAUVAIN'S: Sign

With the patient in the side position and the uppermost hip in extension, the femoral condyles of the affected side are grasped by one hand of the examiner while the palm of the other hand is placed on the abdomen of the patient between the iliac spines. The femur is then rotated provoking a pecular type of reflex spasm of the abdominal muscles. (Figs. 57 A & B).

Significance: The sign is commonly present in Tuberculosis of the hip.

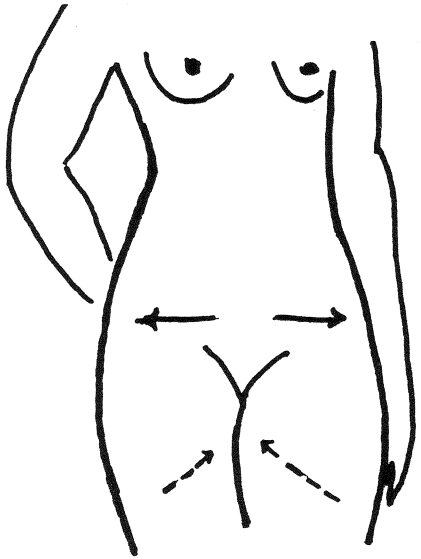


Figure 58

GEIGEL'S: Reflex

The female counterpart of the cremasteric reflex in the male (Fig. 58).
Procedure: (See Cremasteric Reflex) The normal response (see unbroken arrow) consists of a contraction of the muscular fibers at the upper edge of Poupart's Ligament (The inguinal ligament).

Significance: See Cremasteric Reflex

Synonym: Inguinal Reflex

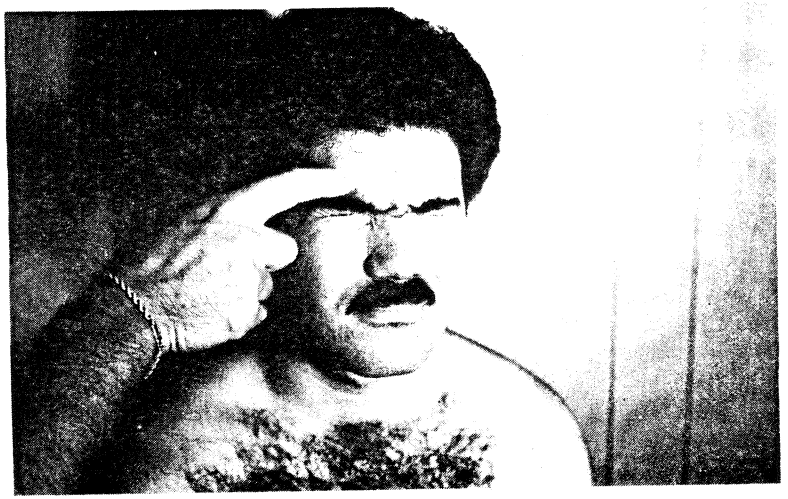


Figure 59

GLABELLA: Reflex

The examiner lightly taps the forehead of the patient either between the eyebrows or upon the supraorbital ridge (illustrated) with the index finger. The reflex is present when there is resulting persistent tonic spasm of the Orbicularis Oculi muscle with closing of the eyes (Fig. 59).

Significance: This is a pathologic reflex of the head indicating corticospinal tract disease; evidence of damage to the connections between the frontal cortex and the facial nerve nucleus in the pons. Is seen in Parkinson's Disease, presenile dementia and diffuse frontal lobe tumors.

Synonym: McCarthy's Sign

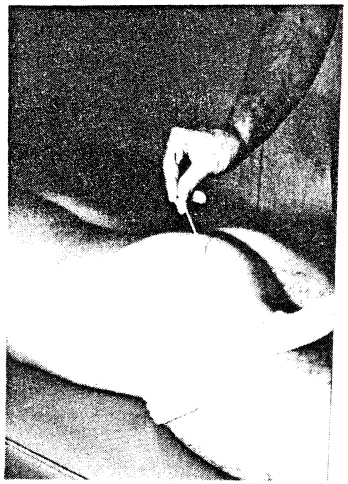


Figure 60

GLUTEAL: Reflex

Procedure: With the patient prone the examiner strokes directly the skin of the buttock from the center upward. Normally there is an obvious contraction of the gluteal musculature (Fig. 60).

Significance: Loss of this Superficial reflex indicates a lesion at or above L4 & L5 segmental level.

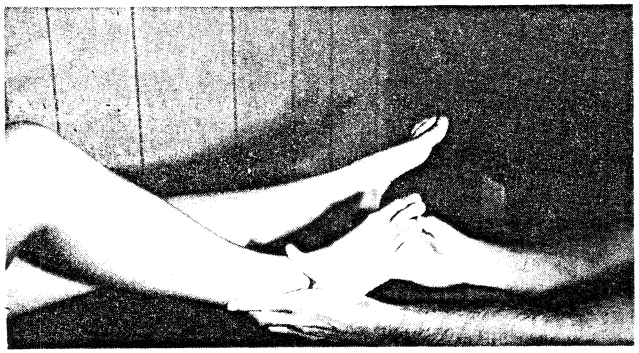


Figure A

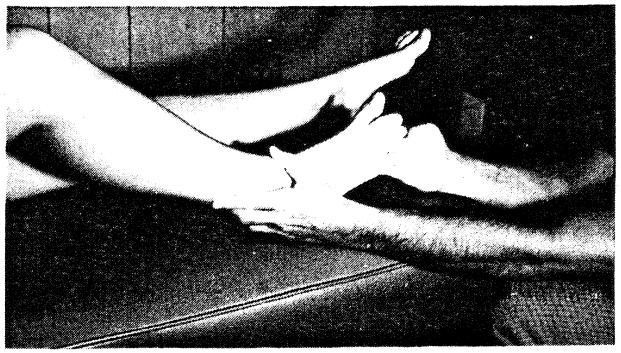


Figure 61

GONDA: Reflex

Upward movement of the big toe (Babinski Toe Sign) upon pressing one of the other toes (especially the 4th) downward and releasing it with a snap (Fig. 61).

Significance: A pathologic reflex of the lower limb signifying corticospinal (pyramidal) tract disease.

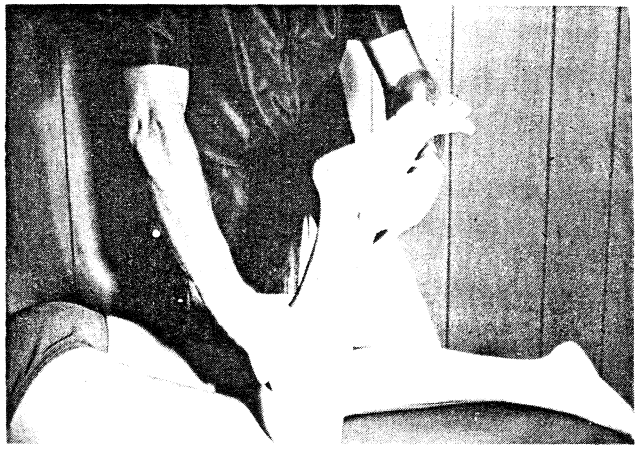


Figure 62

GORDON'S: Reflex

Dorsiflexion (extension) of the great toe or all of the toes

upon firm compression of the calf muscles (Fig. 62).

Significance: A lower extremity pathologic reflex signifying a Pyramidal Tract lesion.

Synonyms: Flexor; Paradoxical Reflexes; Gordon's Leg Sign

Figure 63 A

Figure 63 B

Figure 63 C

Figure 63 D

GOWER'S: Maneuver

Is a method whereby a victim of progressive muscular dystrophy is required to climb up on the body to arise from a recumbent position. The patient turns over to a prone position (Fig. 63 A), then balancing on all fours (Fig. 63 B), pushes himself up by bracing his hand on the thighs (Fig. 63 C) and thus thrusting himself up by climbing up on his thighs (Fig. 63 D).

Significance: Severe muscular degeneration

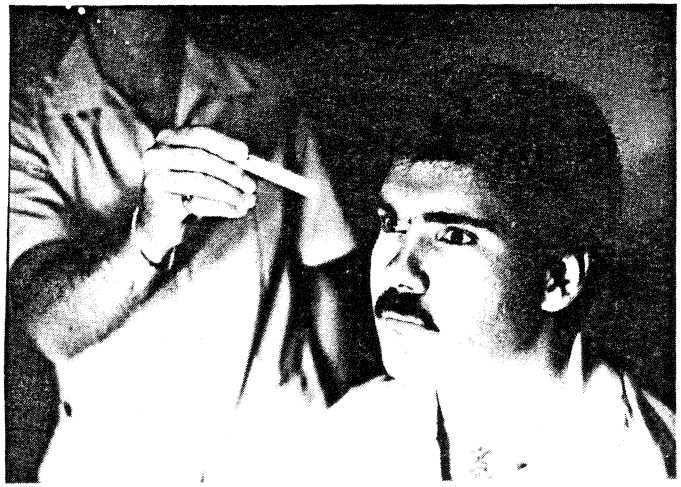


Figure 64 A

Iris Oscillation
Figure 64 B

GOWER'S: Sign

Abrupt intermittent oscillation of the iris when stimulated by light (Figs. 64 A & B).

Significance: The sign is seen in certain stages of Tabes Dorsalis

Figure 65 A

Figure 65 B

GRASP: Reflex

A highly sophisticated reflex of great clinical importance found in paretic limbs characterized by an inability to relax the muscles after voluntary grasping of an object.

Procedure: The examiner strokes the palm of the patient's hand with his finger or fingers. The test is positive when there is resultant flexion of the patient's fingers and the examiner can maintain traction against this flexion, the patient being unable to release the grasp. At this point, if the examiner strokes the dorsum of the patient's fingers with his other hand, the reflex is immediately inhibited and the patient's flexion is released (Figs. 65 A & B).

Significance: The reflex is normal in infants up to ten months of age, otherwise it denotes when unilateral, a lesion of the opposite frontal lobe. When the frontal lesion is diffuse, "forced grasping" and groping may result in which case the patient is unable to refrain from grasping and groping at any object proffered to his visual field or touched by the palm of his hand. The reflex is also seen in terminal congestive heart failure and anoxia or severe toxic states.

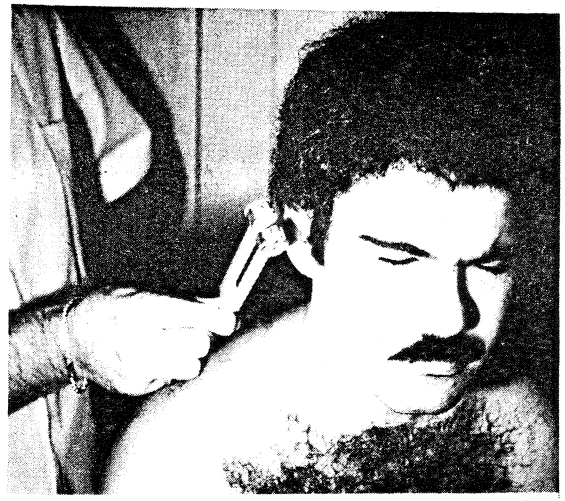


Figure 66 A

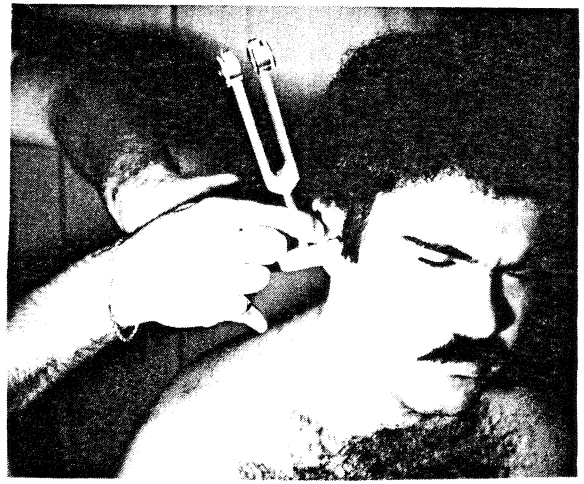


Figure 66 B

GRUBER: Test

Procedure: A tuning fork is set into vibration and held close to the patient's ear (Fig. 66 A). The patient signifies when the sound is no longer heard after which the examiner places the end of his index finger so as to block off the external auditory

canal; the still vibrating tuning fork is then placed against the examiner's finger (Fig. 66 B). Normally the sound becomes audible again.

Significance: The maneuver tests the ear's sensitivity to sounds.

Synonym: Kabatschnik Test for Hearing

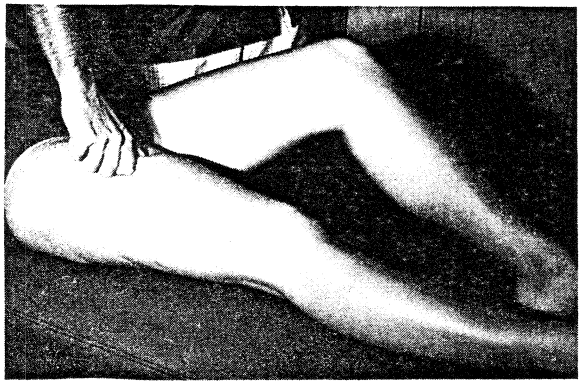


Figure 67 A

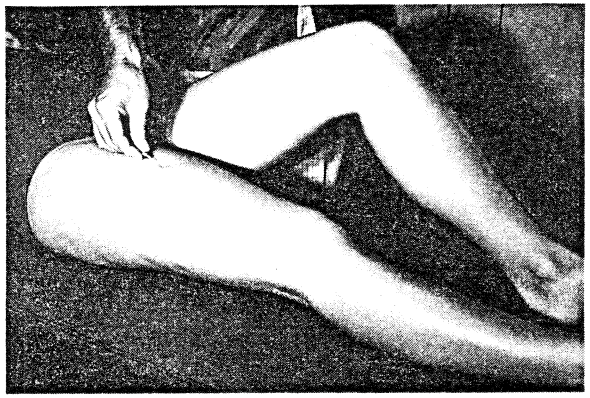


Figure 67 B

GUILLAND'S: Sign

With the patient supine there is brisk flexion of the hip and

the knee when the quadriceps muscle on the opposite limb is irritated, e.g. firmly pinched, etc. (Figs. 67 A & B).

Significance: A sign of meningeal irritation.

Figure 68 A
Light shined in non-affected eye
(pupillary constriction)

Figure 68 B
Light shined in affected eye
(pupillary dilatation)

Figure 68 C
Light back to non-affected eye
(prompt and sustained contraction)

GUNN PUPILLARY: Sign

With the patient's eyes fixed at a distance in a well lighted room, a strong light is shined first in the non-affected or intact eye producing crips bilateral contraction (Fig. 68 A). On moving the light to the questionable or affected eye both pupils dilate (Fig. 68 B); then going back to the "good eye" both pupils contract promptly and remain contracted (Fig. 68 C).

Significance: A positive sign indicates general damage to the Optic Nerve or a residual abnormality of an old retrobulbar neuritis.

Synonyms: Swinging Flashlight Sign; Marcus-Gunn Pupillary Phenomenom

Figure 69 A

Figure 69 B

HAMSTRING: Reflex

Procedure: With the patient supine on a table and the knees

semiflexed and abducted, the examiner hooks his index finger around the tendons of the semimembranosus and semitendinosus muscles (Fig. 69 A) and then strokes the tendons through the finger with a reflex hammer (Fig. 69 B), eliciting contraction of the Hamstring Muscles.

Significance: The above is a stretch (deep) reflex testing the integrity of L4, L5, S1 & S2 nerve roots; an absent or decreased reflex indicating a lower motor neuron lesion: an exaggerated reflex indicating an upper motor neuron lesion when associated with other standard criteria. When the reflex elicits knee flexion it is referred to as The Stookey Reflex and has the same significance.

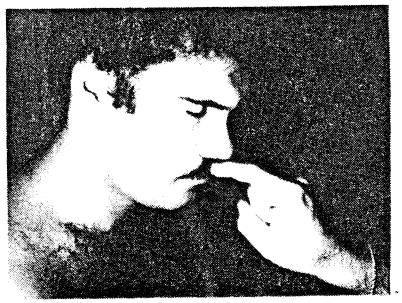


Figure 70 A

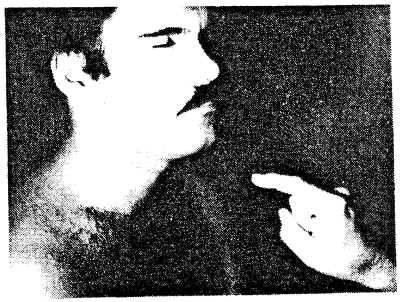


Figure 70 A

HEAD RETRACTION: Reflex

Sharp downward precussion upon the upper lip with the head

inclined slightly into flexion produces head bending (Fig. 70 A) followed by brisk head retraction (Fig. 70 B).

Significance: Is a head pathologic reflex signifying corticospinal tract disease at a level above the Foramen Magnum.

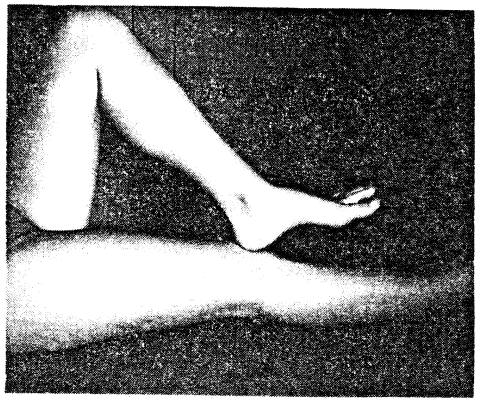


Figure 71 A

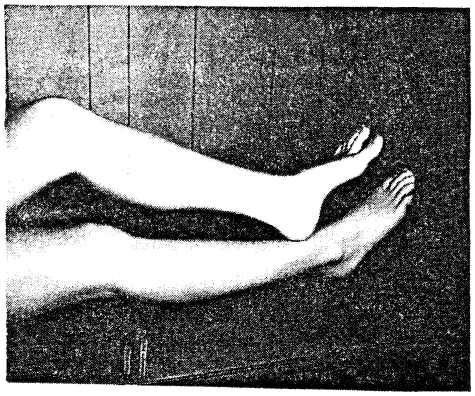


Figure 71 B

HEEL-KNEE: Test

The supine patient is directed to place the heel of one leg

squarely on the opposite knee (Fig. 71 A), and then to pass the heel slowly down the front of the shin to the ankle (Fig. 71 B). The test is done bilaterally with the eyes open and then closed.

Significance: Inability to perform the above in a smooth, coordinated manner is evidence of proprioceptive system imbalance.

Specifically: If the patient's performance is notably better with the eyes open, Posterior Column Disease is indicated; if the performance is equally bad with the eyes open and closed, a Cerebellar lesion is indicated.

Synonym: Heel to Shin Test

Figure 72 A

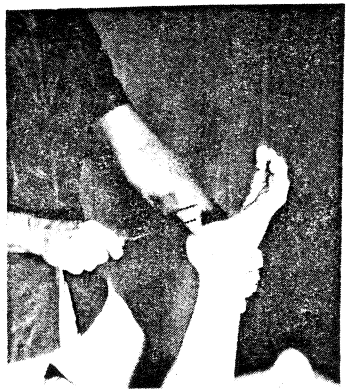


Figure 72 B

HEEL-TAP: Test

Fanning and plantar flexion of the toes produced by tapping with a reflex hammer around the patient's heel (Figs. 72 A & B).

Significance: Is a pathologic reflex signifying Pyramidal tract disease.

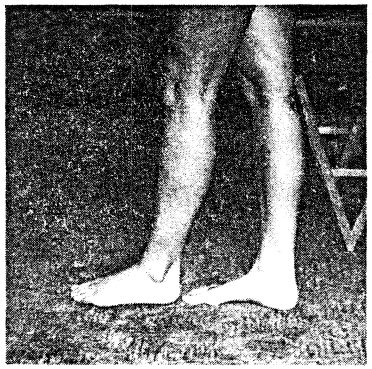


Figure 73 A

Figure 73 B

HEEL-TOE: Test

The patient is asked to walk in a straight line heel to toe approximately seven to ten steps forward then turn around briskly and walk heel to toe back. Normally this can be done without faltering or loss of balance provided there is normal lower limb strength (Figs. 73 A & B).

Significance: Inability to perform normally is evidence of proprioceptive system imbalance.

Synonym: Tandem Gait Test

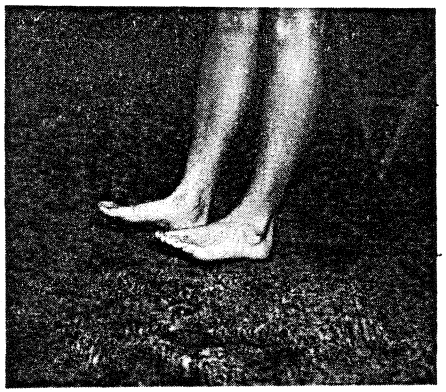


Figure 74

HEEL-WALK: Test

The patient is directed to walk on the heels several steps forward and then back the same way. The normal patient should be able to perform this easily (Fig. 74).

Significance: Inability to perform because of either pain or weakness in the presence of low back complaints is evidence of a lesion of the fibers of L5 Nerve Root.

Figure 75 A

Figure 75 B

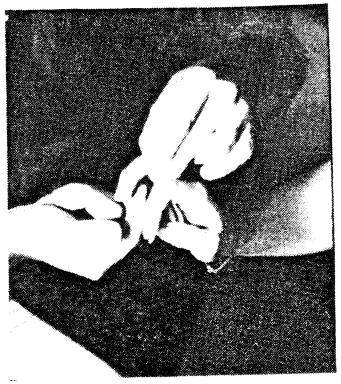


Figure 75 C

HOFFMANN'S: Reflex

Procedure: Examiner supports the patient's hand so that it is

relaxed, the middle finger is extended and the middle phalanx is grasped between the examiner's thumb and long fingers (Fig. 75 A). With a flip of the examiner's other thumb, the nail or the terminal phalanx of the patient's middle finger is snapped or flicked forward (Fig. 75 B) and released into extension. The response is a flexion and adduction of the thumb and flexion of the fingers (Fig. 75 C).

Significance: Opinion is divided as to valid significance. The reflex is generally regarded as one indicative of corticospinal tract disease. Others consider it of doubtful value as it is often present in tense normal subjects and is frequently absent in well pronounced disease of the Pyramidal system. It can validly be regarded as an exaggerated form of the finger reflex, indicative of a state of increased muscle tone.

Synonyms: Hoffman's Sign; Digital Reflex; Finger Flexion Reflex.

Figure 76 A

Figure 76 B

HOLMES': Sign

When a patient's arm is flexed at the elbow against the resistance of the examiner (as if he is pulling it away from the shoulder - Fig. 76 A) and is suddenly released, it will strike the patient's body or face (Fig. 76 B).

Significance: Lack of "Check Reflex" indicating a Cerebellar Lesion.

Synonyms: Holmes Rebound Phenomemom; The Arm-pulling Test for Rebound.

Figure 77

HOOVER'S: Sign

With the patient supine when asked to raise a paretic leg, the patient involuntarily makes counterpressure downward toward the table with the heel of the other (non-affected) leg. The examiner can feel this counterpressure by placing his hands under both heels. The sign is positive if counterpressure is absent on the healthy side (Fig. 77).

Significance: Evidence of malingering or hysteria, if the affected limb is truly weak or paralysed the downward pressure is accentuated on the healthy side as the patient attempts to raise the weak limb.

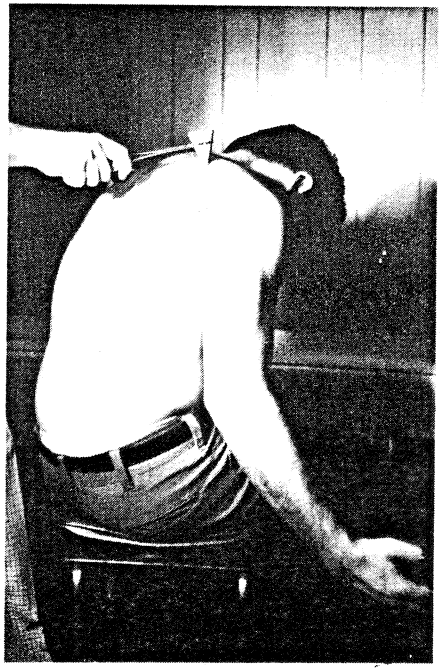


Figure 78

INFRASPINATUS: Reflex

With patient seated, the examiner uses a reflex hammer to stroke the area over the scapula on a line bisecting the angle formed by the spine of the bone and its inner border; normal response is external rotation of the arm with simultaneous extension of the elbow (Fig. 78).

Significance: Integrity of C5-6 nerve roots and the Suprascapular Nerve; also can be performed in the recumbent position.

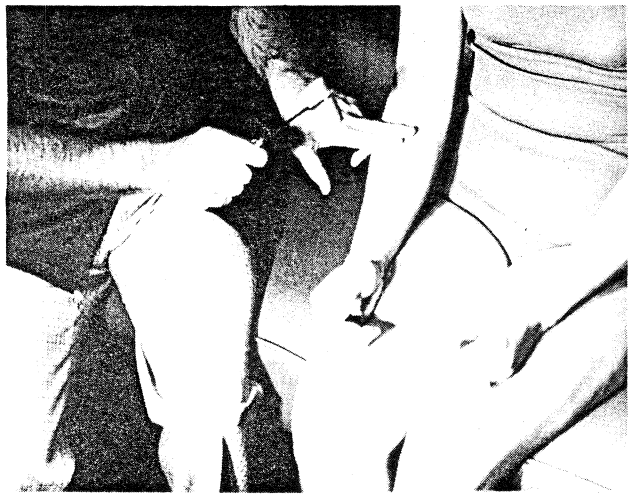


Figure 79 A

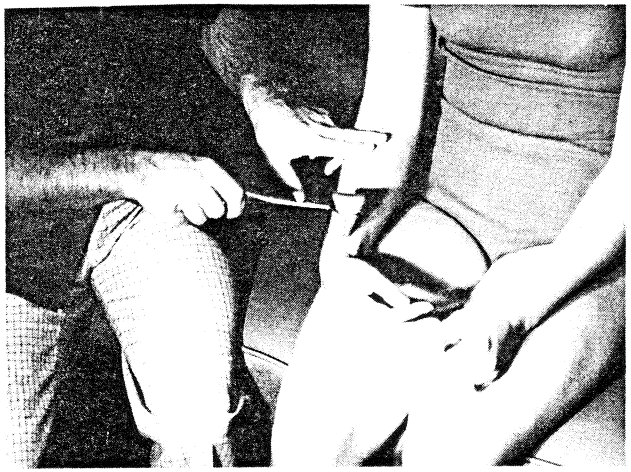


Figure 79 B

INVERTED RADIAL: Reflex

Is produced when the performance of the Brachioradial reflex (Fig. 79 A) elicits flexion of the hand and fingers without forearm flexion or response (Fig. 79 B).

Significance: An important arm reflex signifying a lesion of the 5th Cervical segment of the spinal cord.

Figure 80

JANDRASSIK'S MANEUVER (for): Reflex

If the patellar reflex is absent (Westphal's Sign) and cannot be obtained in the normal manner, this procedure should be tried. The patient hooks his hands together by the flexed fingers and pulls on the clenched hands as hard as he can at the moment the reflex is performed (Fig. 80).

Significance: A maneuver for emphasizing the patellar reflex.

Figure 81 A

Figure 81 B

JAW: Reflex

Procedure: The patient, seated and relaxed, is directed to let the jaw sag thereby opening the mouth approximately one half inch. The examiner lays the distal and middle phalanx of

his index finger on either side of the mandible in the groove between the teeth and the mental protuberance. Giving slight traction downward and opening the mouth approximately a quarter inch further the examiner strokes his distal interphalangeal joint on each mandibular half with a reflex hammer. Normally the examiner can feel and observe the stretch response of the masseters and pterygoids as the jaw retracts (Figs. 81 A & B).

Significance: The primary purpose of the above described stretch reflex is to determine and differentiate an upper from a lower motor neuron lesion of Cranial Nerve V and its central connections using the standard criteria for each.

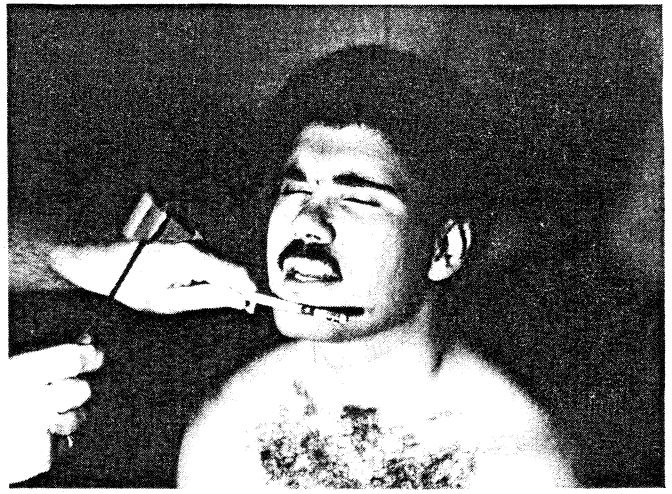


Figure 82

JAW JERK: Sign

The patient with the mouth open slightly has the center of the jaw tapped by a percussion hammer directly or with the interposition of a finger or pencil. The sign is present when the jaw snaps or jerks closed with noticible hyper-reflexia (Fig. 82).

Significance: Damage to the cortical innervation of the motor

portion of the Trigeminal Nerve; in unilateral Frontal Lobe lesions the Jaw Jerk may be increased on the opposite side only.

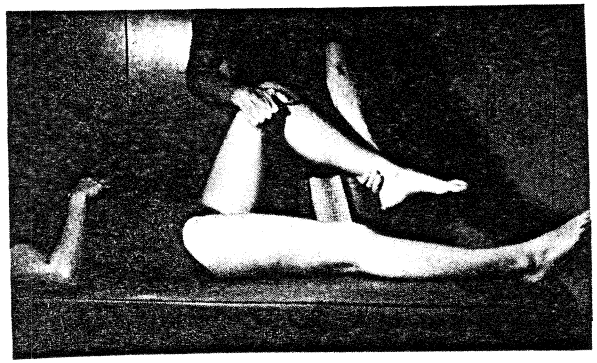


Figure 83 A

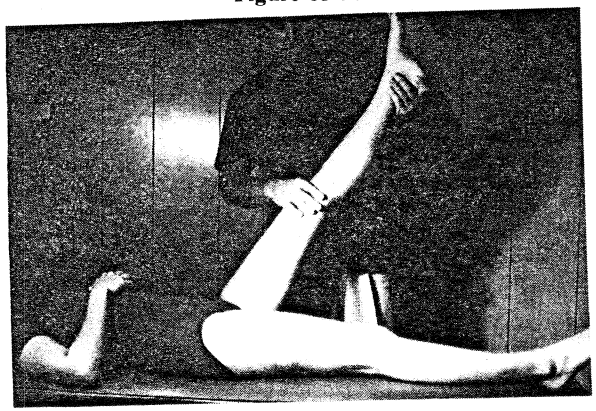


Figure 83 B

KERNIG: Sign

With the patient supine, the examiner passively flexes the thigh upon the pelvis to a right angle (Fig. 83 A), then an attempt is made to completely extend the leg (Fig. 83 B). When pain prevents the complete performance of this maneuver the sign is present.

Significance: This is the most reliable and constant sign of

meningeal irritation. The sign is also present in certain radiculopathies.

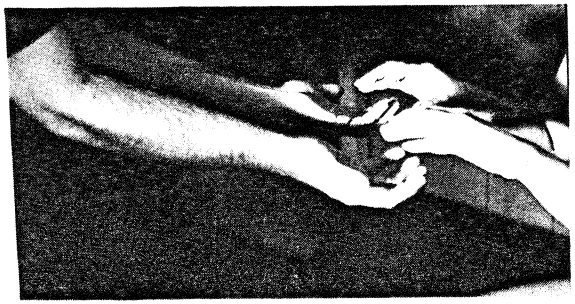


Figure 84 A

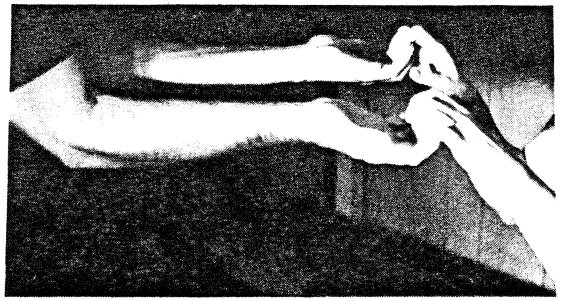


Figure 84 B

KLEIST'S: Sign

When the fingers of the patient are gently elevated by the fingers of the examiner, (Fig. 84 A) reactive flexion of the fingers of the affected hand will cause them to hook into the examiner's fingers instead of passively going into extension. (Fig. 84 B).

Significance: An upper extremity pathologic reflex indicative of Frontal and Thalamic lesions.

Synonym: Kleist's Hooking Sign

Figure 85 A

Figure 85 B

KLIPPEL-WEIL: Sign

When the flexed fingers of the affected limb (Fig. 85 A) are quickly extended by the examiner (pryed open), flexion and adduction of the patient's thumb is elicited (Fig. 85 B).

Significance: An upper extremity pathologic reflex indicative of Pyramidal Tract disease.

Synonyms: Klippel-Weil Sign; Klippel & Weil Thumb Sign.

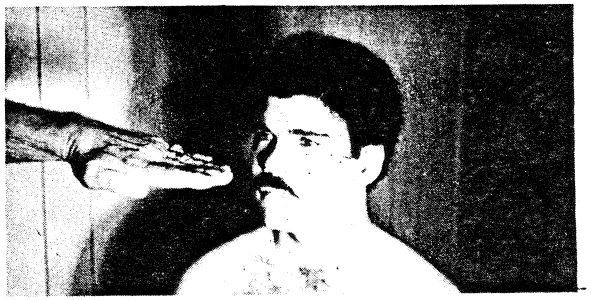


Figure 86 A

Figure 86 B

KOCHER'S: Sign

The examiner places his hand on a level with the patient's eyes and then lifts it rapidly instructing the patient to keep looking at it (Fig. 86 A). The sign is present when the patient's upper lid springs up more quickly than does the eyeball (Fig. 86 B).

Significance: A sign of Graves Disease

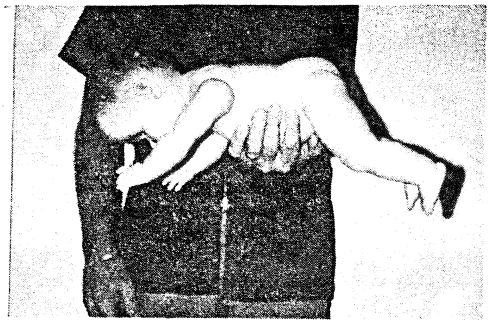


Figure 87 A

Figure 87 B

LANDAU: Reflex

A special neck reflex occurring normally in infants from several weeks after birth up to 24 months of age.

Procedure: The infant is supported under the chest by one hand, the neck extends, the back arches and the extremities extend (Fig. 87 A). If the head then is passsively flexed by the examiner, the extension of the trunk and limbs disappears and the infant folds up like a jackknife (Fig. 87 B).

Significance: This reflex is a primitive movement pattern, it disappears as the higher cerebral pathways establish dominance over the primitive reflexes during maturation. Any undue persistence of this "tonic neck reflex" posture

either when spontaneously assumed by the infant or induced by the examiner predicts poor motor development. It indicates cortical dominance is not proceeding according to the normal development time table.

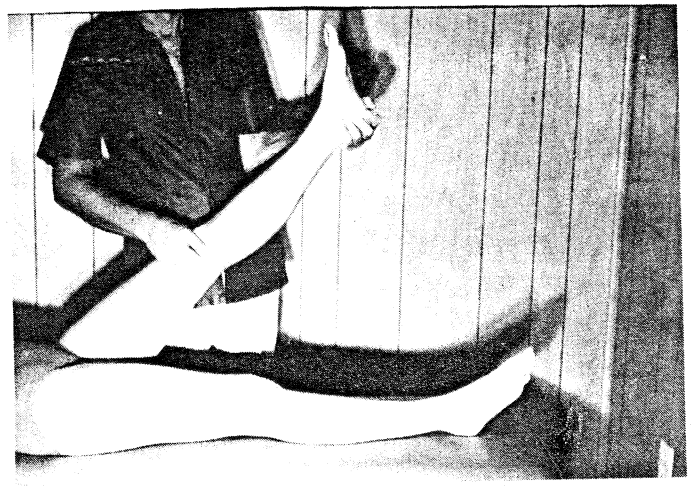


Figure 88

LASEGUE: Sign

With the patient supine and the knee in extension, the hip is passively flexed. The test is positive if pain is aggravated or reproduced along the course of the Sciatic Nerve. The angle of flexion at which pain occurs as well as the site and degree of pain are always recorded. Normally the limb can be elevated to 90 degrees with no radicular pain (Fig. 88).

Significance: The above test is synonymous with the Straight Leg Raising Test and is of little particular diagnostic importance; it is accepted generally as a sign of lumbar and lumbosacral radiculopathy and is seen in most cases of sciatica.

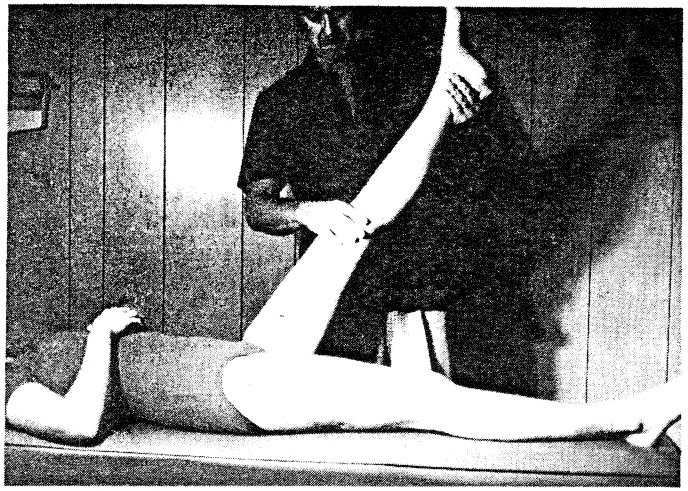


Figure 89 A

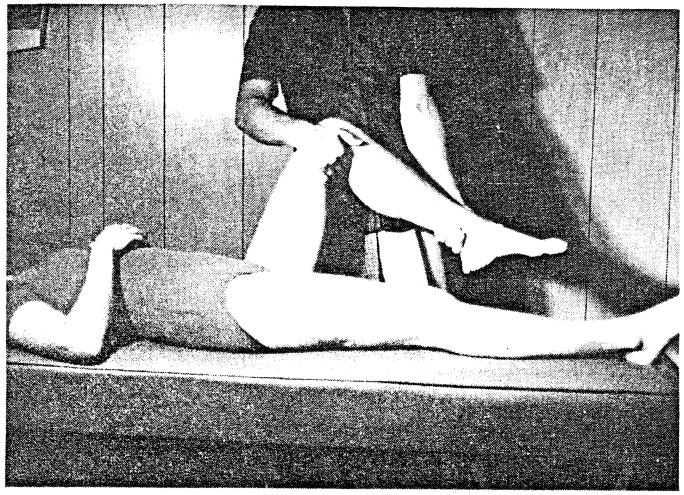


Figure 89 B

LASEGUE DIFFERENTIAL: Sign

If in a patient with sciatica the examiner elicits pain on flexing the hip with the knee extended (Fig. 89 A), but flexing the thigh on the pelvis with the knee flexed produces no sciatic pain (Fig. 89 B), the sign is present.

Significance: Hip joint disease is ruled out.

Note: Many modifications of the two previous signs have been designated, e.g. dorsiflexion of the foot with straight leg raising on the affected side increasing the pain is BRAGARD'S SIGN: Strongly dorsiflexing the great toe and increasing the pain is SICARD'S SIGN; and flexion of the affected leg is noted on stooping (NERI'S SIGN).

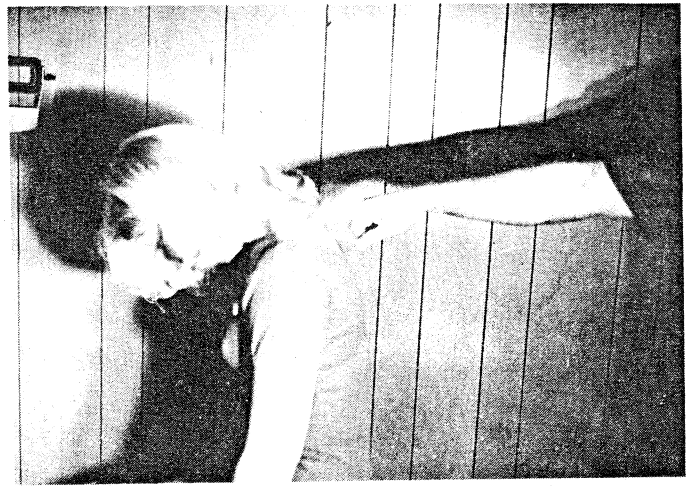


Figure 90

LHERMITTE'S: Sign

An electric or "shock-like" sensation radiating down the neck and spine experienced by the patient when bending the neck into flexion (Fig. 90).

Significance: Is a sign of Posterior Column disease of the spinal cord viewed by many to be pathognomonic of Multiple Sclerosis.

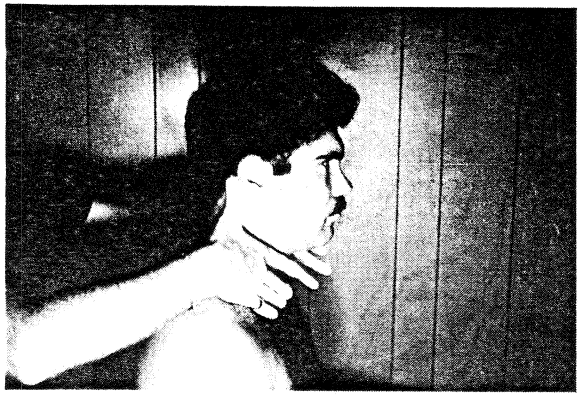


Figure 91 A

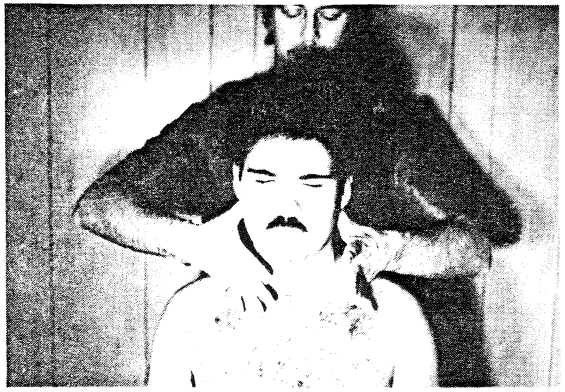


Figure 91 B

LIBMAN: Test

With the patient seated, the examiner from behind places his thumbs on each of the patient's mastoid process tips and exerts pressure bilaterally toward the midline (Figs. 91 A & B).

Significance: Is a test for pain threshold, patients having a low pain threshold will complain of pain upon slight compression; patients with a normal pain threshold will describe just pressure or tenderness; patients having a high pain threshold will state they feel nothing.

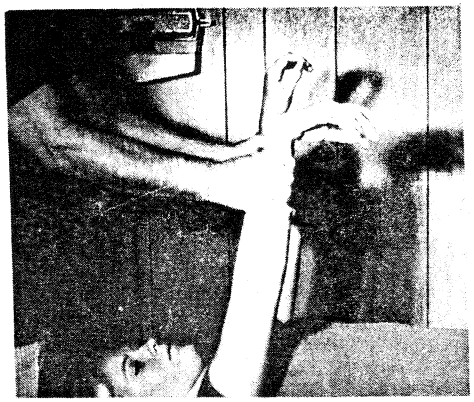


Figure 92 A

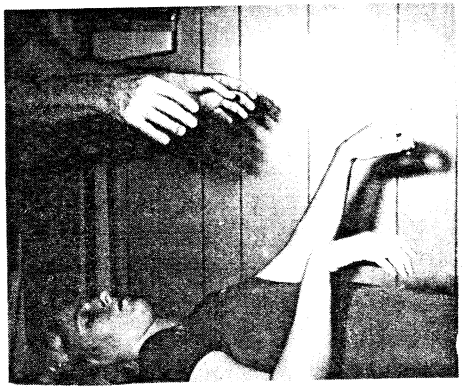


Figure 92 B

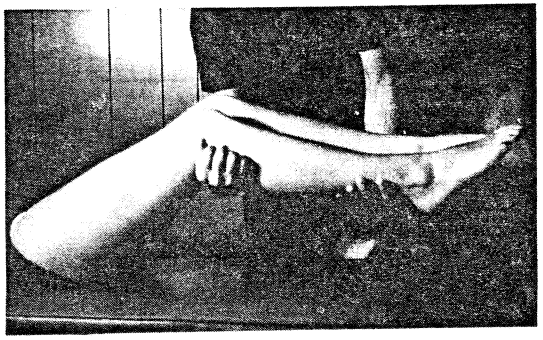


Figure 93 C

LIMB DROPPING: Tests

1. Wrist-Dropping: With the patient supine, the examiner

grasps both of the patient's forearms just proximal to the wrist and his holding them vertical shows the wrist with flaccid paralysis dropping at right angles while the nonhemiplegic wrist remains to some degree vertical. (Fig. 92 A).

2. Arm-Dropping: Grasping both forearms as in the wrist-dropping test and releasing them simultaneously shows the hemiplegic arm dropping limply, while the normal arm glides or floats down (Fig. 92 B).

3. Leg-Dropping: The patient is supine and the examiner crooks the patient's knees over his arm (Fig. 92 C) extending first one leg, and then the other, the examiner drops them in turn to the bed or a table; one can see and hear the difference as the hemiplegic leg drops more rapidly and limply.

Significance: Flaccid paralysis of the extremities is verified by the above tests which depend upon the principle of asymmetry of muscle tone. For correct interpretation the non-affected side must have some muscle tone, hence the tests are invalidated if the patient is completely atonic such as in a deep coma when tone and reflexes are lost on both sides. The tests may also be used to check out simulated paralysis of the malingerer or the hysteric who while alleging unilateral weakness will show the same signs bilaterally.

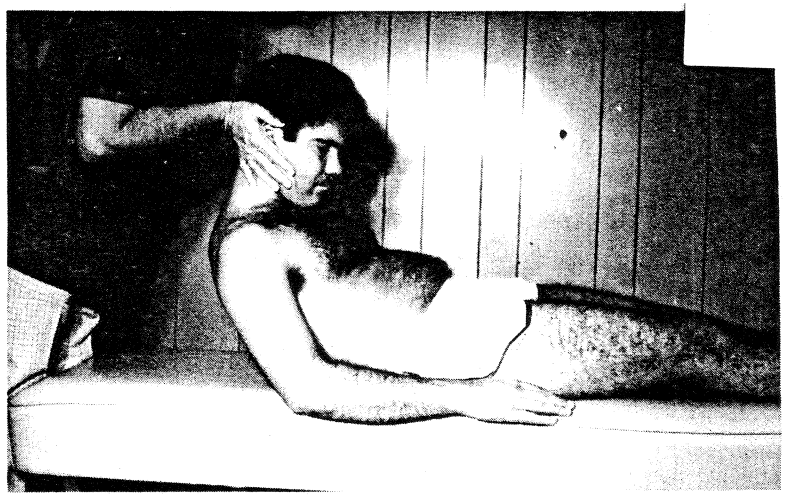


Figure 93

LINDNER'S: Sign

With the patient supine, the examiner standing behind the patient's head puts both hands in back of the posterior occiput and enforces head, neck and dorsal-lumbar flexion, rounding the trunk into one large "C-shaped" curve. The sign is present when it aggravates or reduplicates the radicular pain of the main complaint (Fig. 93).

Significance: Low back nerve root compression

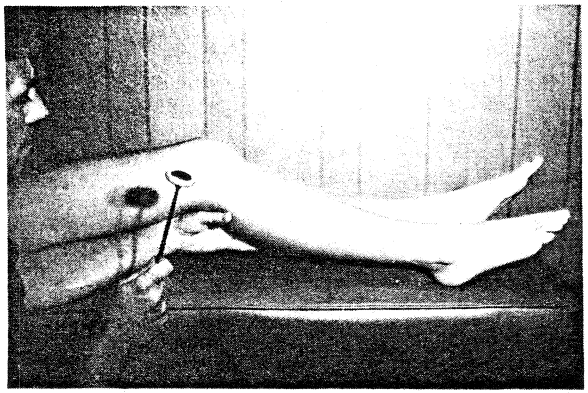


Figure 94 A

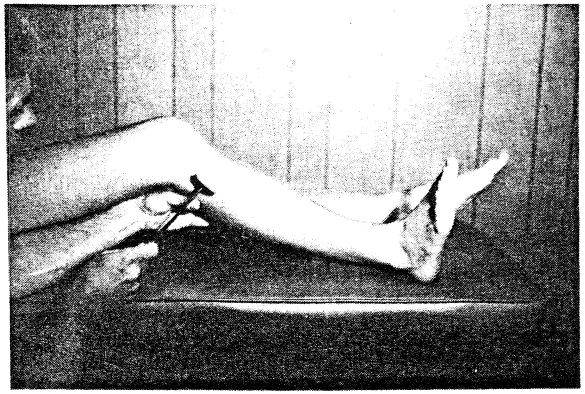


Figure 94 B

LUST'S: Sign

Abduction with dorsal flexion of the foot on tapping the External Popliteal Nerve just below the head of the fibula while the knee is released and slightly flexed (Figs. 94 A & B).

Significance: Spasmophilia of the External Popliteal Nerve; often seen as a sign of latent Tetany.

Synonym: Peroneal Sign

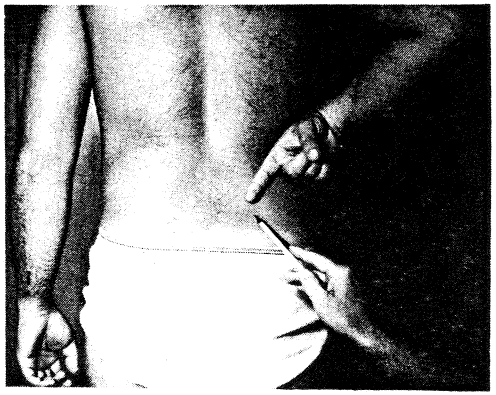


Figure 95 A

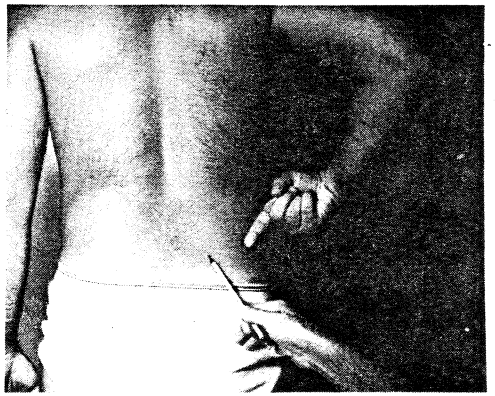


Figure 95 B

MAGNUSON'S: Test

Procedure: The patient with low back pain is asked to point to the site of the pain and the examiner marks that site. The examiner then distracts the patient by performing any relevant examination away from the marked site of pain, then resuming the examination of the low back. The test is positive with any significant change of the site of the pain (Figs. 95 A & B).

Significance: Simulated pain, hysteric or malingering

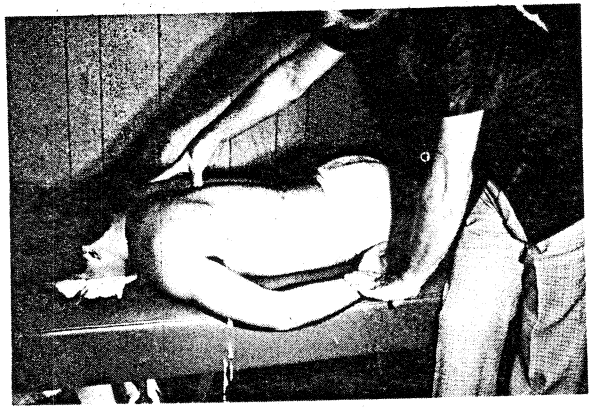


Figure 96 A

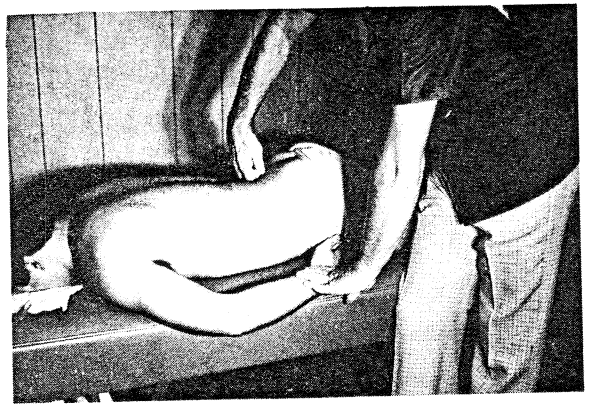


Figure 96 B

MANNKOPF'S: Sign

The examiner palpates the patient's pulse rate and then applies pressure or another stimulant over the pain area, or - the examiner takes the patient's pulse rate for one minute, the patient being made as comfortable as possible; then without changing the patient's position the examiner applies mechanical pressure or electrical stimulation over the painful area while monitoring the pulse rate (Figs. 96 A & B).

An increase of ten or more in the pulse rate constitutes a positive sign.

Significance: The sign is absent in simulated pain.

Synonym: Rumpf's Sign No. 2 (seen in neurasthenia)

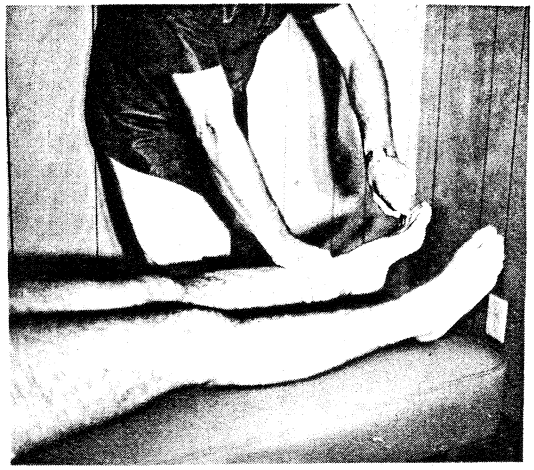


Figure 97 A

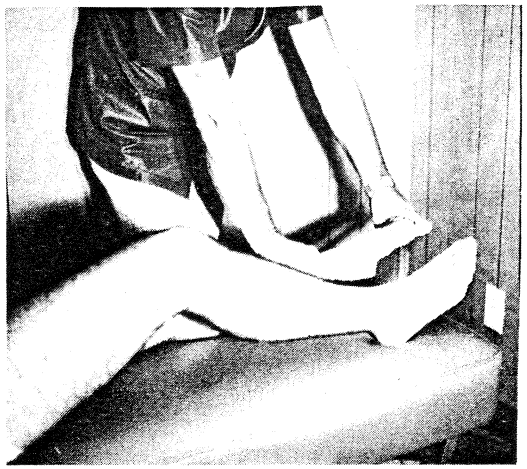


Figure 97 B

MARIE-FOIX: Sign

The hip and knee are drawn into flexion and retracted upon

transverse pressure of the tarsus or upon forcing the toes downward into flexion even when the leg is incapable of voluntary movement (Figs. 97 A & B).

Significance: A pathologic reflex of the lower limb indicating a Pyramidal Tract lesion.

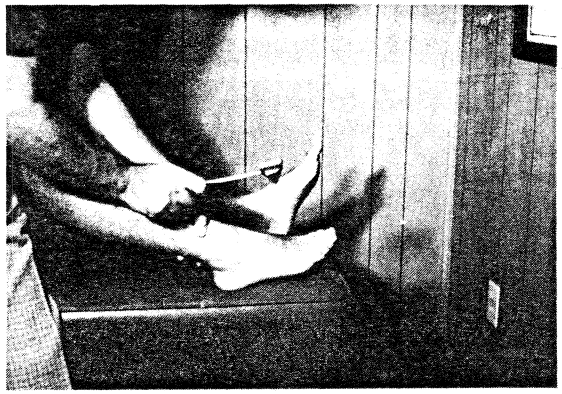


Figure 98 A

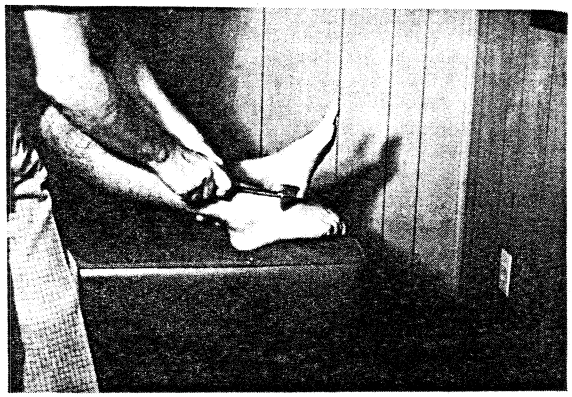


Figure 98 B

MENDEL-BECHTEREW: Sign

Tapping with a percussion hammer upon the dorsum of the foot over the cuboid bone produces flexion movement of the outer four toes (Figs. 98 A & B).

Significance: An uncommon pathologic reflex indicating Corticospinal Tract disease.

Synonyms: Cuboidodigital; dorsocuboidal; Mendel-Bekhterev and Tarsophalangeal Reflexes.

Figure 99 A

Figure 99 B

Figure 99 C

MINOR'S: Sign

A method of arising from a chair whereby the patient grasps

both arms of the chair with his hands, leans forward, jackknifing the thighs and the dorsolumbar spine so that his head is over the feet. Thus bringing the elbows into acute flexion the patient then pushes himself to an upright position by straightening out the elbows and in this way spares lower limb effort (Fig. 99 A). The patient may substitute his knees for chair arms and more or less climb up the thighs using the same aforementioned movements (Fig. 99 B). Or the patient may also support himself on the healthy side, placing one hand on the back, bending the affected side and balancing on the healthy leg (Fig. 99 C)

Significance: The sign is characteristic for patients with sciatica.

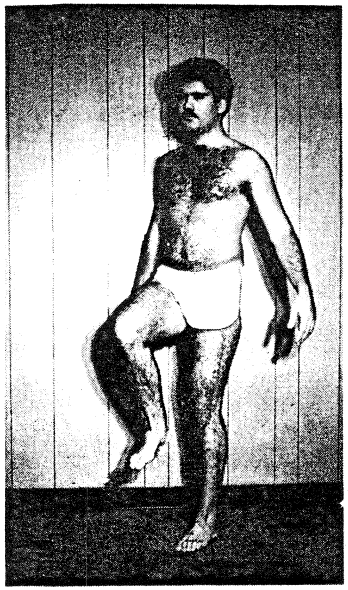


Figure 100 A

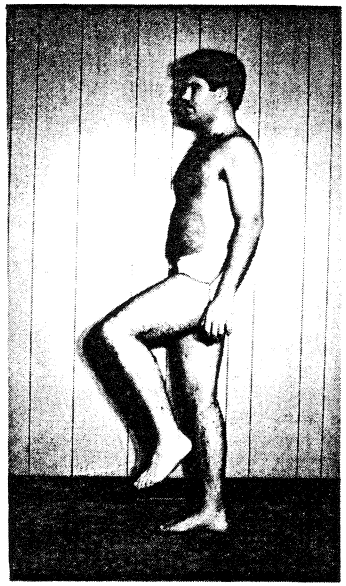


Figure 100 B

MITTELMEYER: Test

Procedure: The patient is directed to take marching steps on

one spot without progressing forward (Fig. 100 A). The test may be performed with the eyes closed. The test is positive when the patient keeps turning to the same side (Fig. 100 B).

Significance: The test is positive in Vestibular disorders; the patient will turn to the side of vestibular loss and/or away from the side of vestibular excitation.

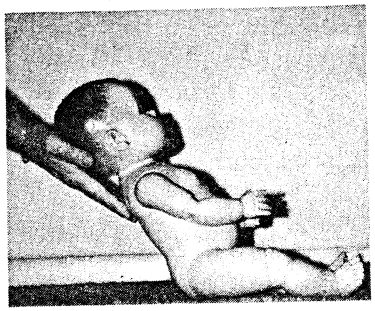


Figure 101 A

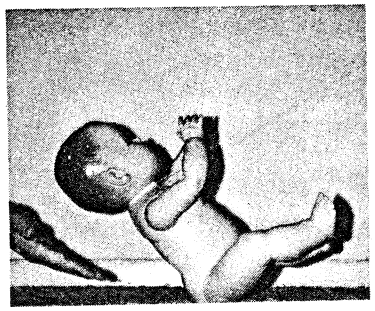


Figure 101 B

MORO: Reflex

In this reflex for infants, the examiner can use different stimulating techniques; one is to manually prop the infant to a sitting position whereby the infant is leaning backward and then to suddenly take away the support for a moment. Another, with the infant supine on a table is to cause a loud sound back of his head, e.g. clapping hands, striking the table, etc. The infant's response to the stimulus is a sudden extension (elbows and knees) and abduction (arms and hips) of all four extremities followed immediately by flexion (elbows and knees) and adduction (arms and hips), the upper extremities simulating an embrace attitude (Figs. 101 A & B).

Significance: The reflex is present normally for about the first three months of life. Absence of the reflex or persistence past three months indicates abnormal development of the motor system (see Landau and Tonic Neck Reflexes).

Synonyms: Startle Reflex; Moro Embrace Reflex

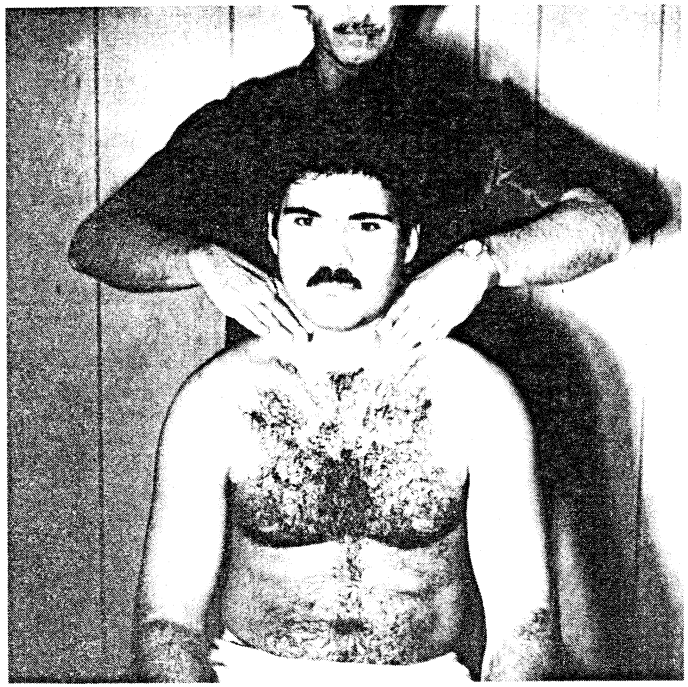


Figure 102

NAFFZIGER'S': Test

Procedure: With the patient seated, the examiner standing behind exerts bilateral compression of the Jugular veins for a period of up to 45 seconds; the patient may also be instructed to cough. The test is positive when the above increases or aggravates pain of sensory disturbance at a segmental level (Fig. 102).
Significance: Nerve root compression by an extruded intervertebral disk or other mass.

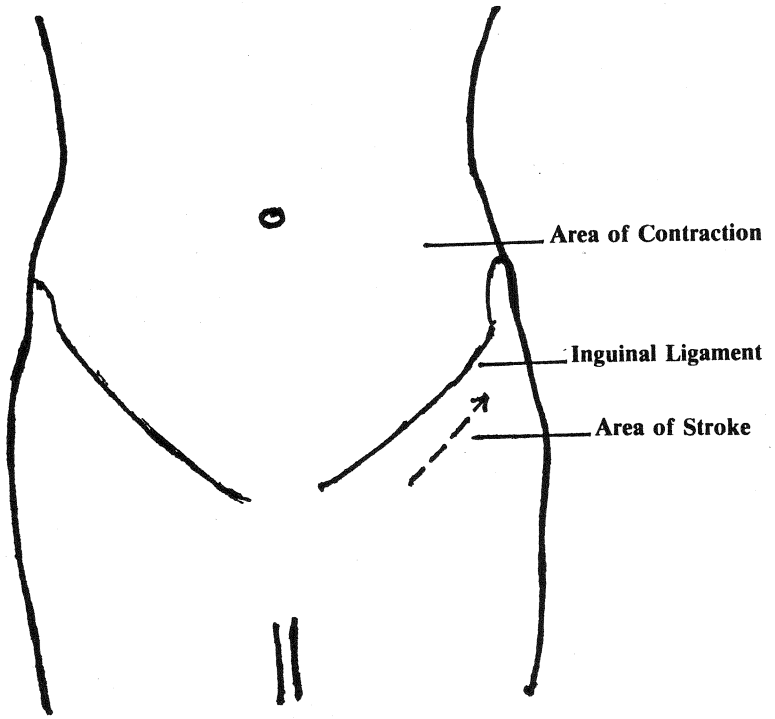
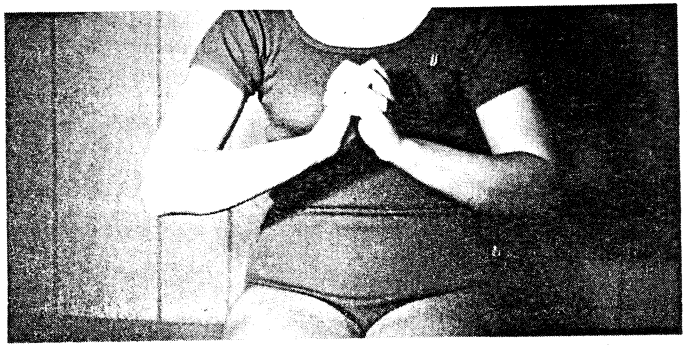


Figure 103

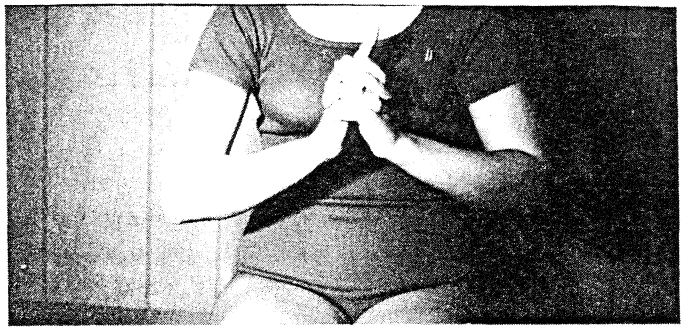
OBLIQUUS: Reflex

A cutaneous reflex in which stimulation of the skin below the inguinal ligament contracts a part of the ipsilateral External Oblique Muscle (Fig. 103).

Significance: Confirms response of the Abdominal Reflex thoracic segments 8 to 12 and demonstrates integrity of the Ilioinguinal Nerve.



Normal
Figure 104 A



Positive Ochsner's Test
Figure 104 B

OCHSNER'S Clasping: Test

Procedure: The patient is asked to clasp the hands together with the fingers interdigitating. The test is positive when the index finger on the affected side fails to flex (Figs. 104 A & B).

Significance: Median Nerve paralysis above the level where the nerve to the Flexor Digitorum Sublimis is given off.

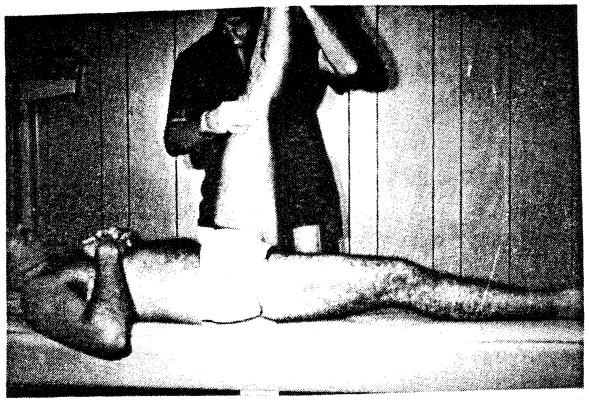


Figure 105 A

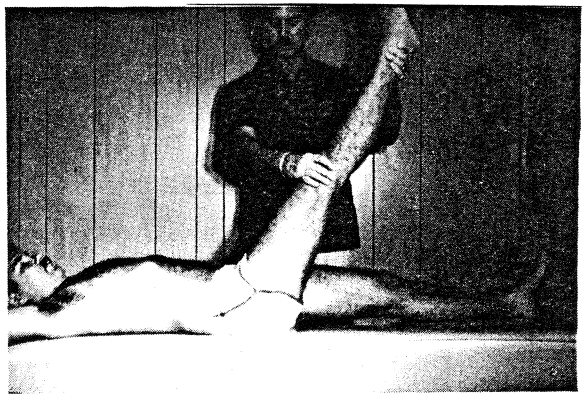


Figure 105 B

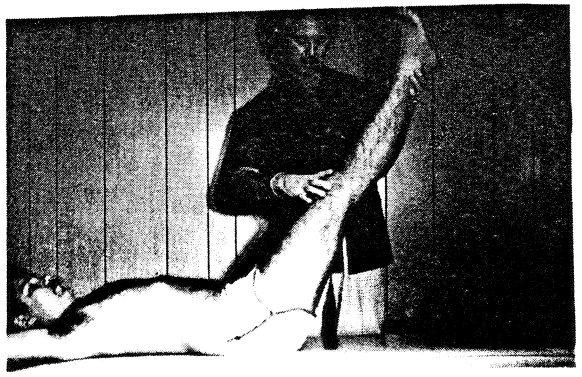


Figure 105 C

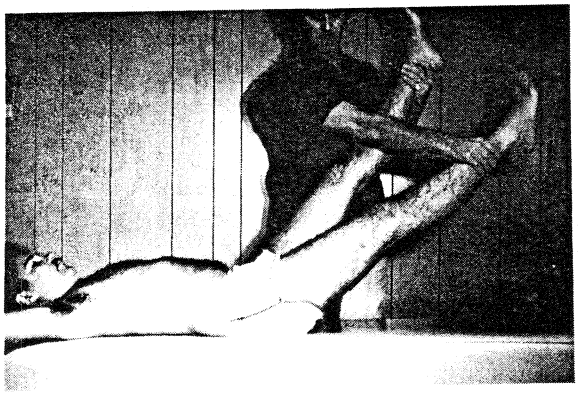


Figure 105 D

O'CONNELL'S: Test

Procedure: The well leg is straight leg raised by the Lasegue maneuver with the angle of flexion and site of pain (if any) recorded (Fig. 105 A). The affected limb is then tested in the same manner and the findings recorded (Fig. 105 B). Then, with both knees extended, both thighs are simultaneously flexed to an angle just short of that which produces pain (Fig. 105 C). The sound side is then lowered (Fig. 105 D), if this lowering causes a marked exacerbation of pain on the affected side, the test is positive.

Significance: Lumbar peripheral neuropathy; the test is evidence of true neuritis proximal to the distal extent of the radiculopathy.

Figure 106

OCULOCARDIAC: Reflex

Procedure: For one minute the examiner monitors the heart rate of the patient in a comfortable position of recumbency, then with the patient in the supine position and the eyelids closed, the examiner palpates the cardiac apex impulse directly (best method), the Carotid Artery, or the Radial Artery (worst method), while applying tolerable digital pressure over the eyeballs. A slowing of from 5 to 13 beats per minute is normal (Fig. 106).

Significance: A slowing of from 13 or more, or from 1 to 5 beats indicates a lesion of Cranial Nerves V or X.

When ocular compression produces an acceleration of the heart it is called Inverted Oculocardiac Reflex with the same significance as above.

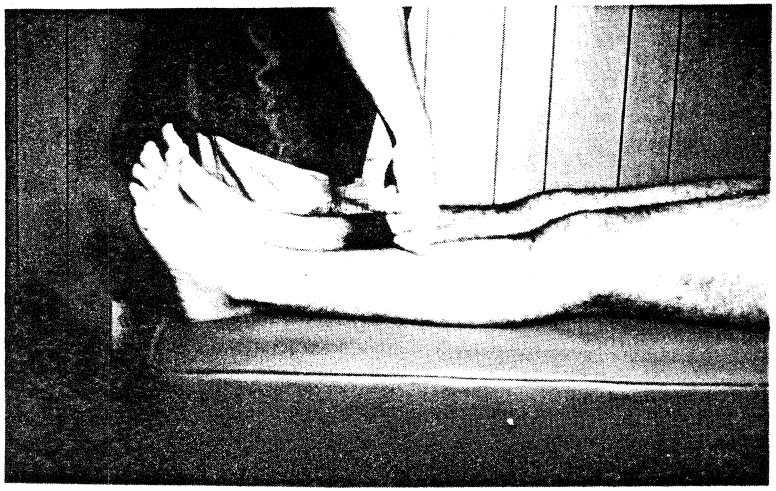


Figure 107

OPPENHEIM: Sign

A modification of the Babinski Sign, elicited by applying heavy pressure either with the index finger and thumb or the knuckles of the index and middle fingers along the anterior tibial surface on either side of the tibial crest stroking from the tibial tubercle to the ankle. A Babinski-like response is seen usually occuring toward the end of the stimulation (Fig. 107).
Significance: see Babinski Sign

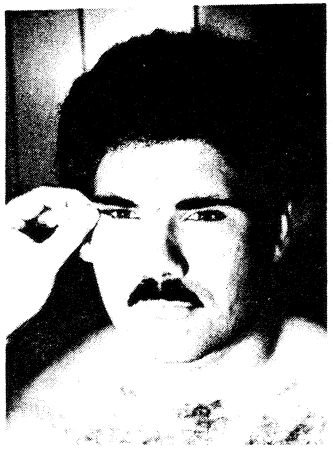


Figure 108 A

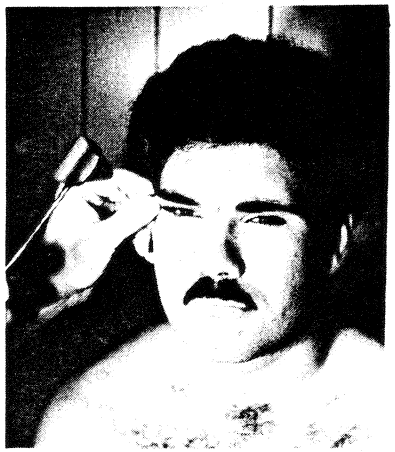


Figure 108 B

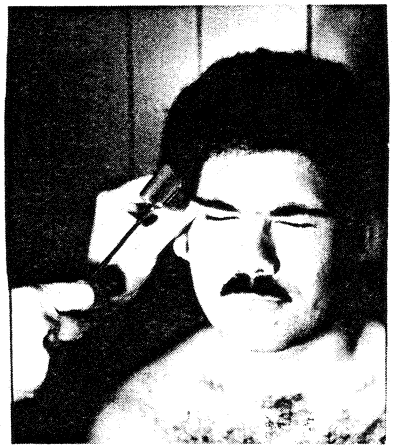


Figure 109 C

ORBICULARIS OCULI: Reflex

Procedure: The skin at the outer corner of the eye is held between the thumb and index finger (Fig. 108 A), the examiner pulling it slightly and then tapping his thumb lightly with a reflex hammer (Fig. 108 B). Normally there follows a reflex contraction of the Orbicularis Oculi muscle with the closing of the eye (Fig. 108 C).

Significance: Dinimution of the reflex is found in Facial

palsies of peripheral origin; exaggeration of the reflex is found in central Facial palsies.

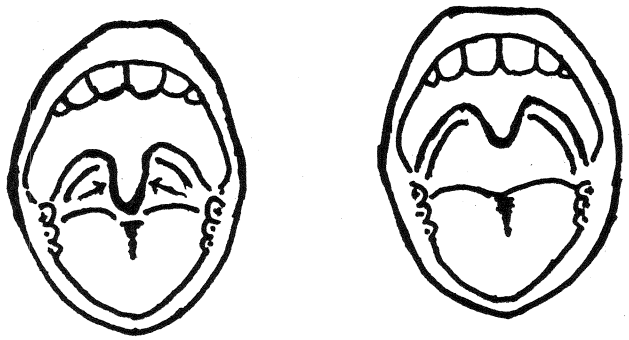


Figure 109

PALATAL: Reflex

Raising of the uvula in phonation or upon irritation of its mucous membrane such as stroking it with an orange stick; the rise is bilateral and symmetrical upon direct and consensual stimulation (Fig. 109).

Significance: see Gag Reflex

Synonym: Uvular Reflex

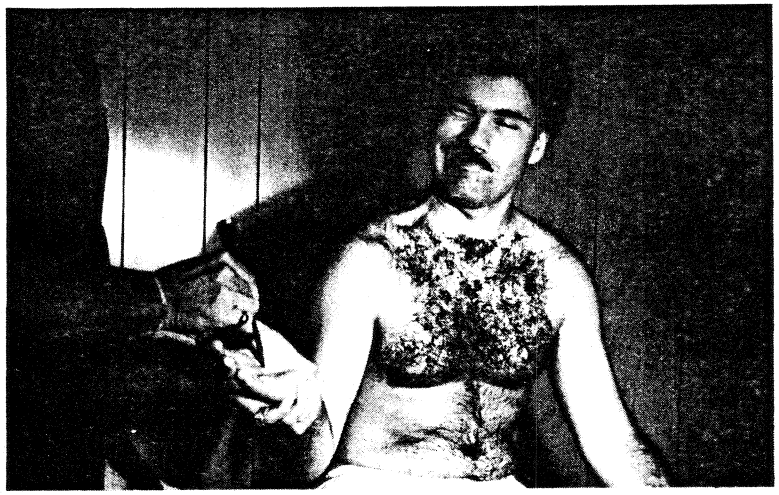


Figure 110

PALM TO CHIN: Reflex

Examiner strokes the palm of the patient with an orange stick or broken tongue depressor. The reflex is present when the homolateral Mentalis Muscle contracts, raising and protruding the lower lip and at the same time wrinkling the skin of the chin as if an expressing doubt or disdain (Fig. 110).
Significance: Pyramidal Tract disease

Synonym: Palmomental Reflex

Figure 111 A

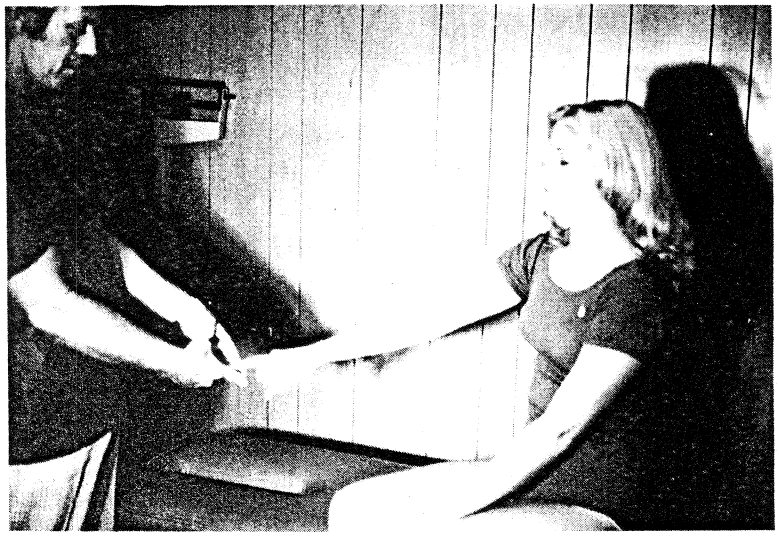


Figure 111 B

PAST-POINTING: Test

Any number of tests in which the patient's coordination is

examined by directing the patient to point and touch various sites usually with the index finger or great toe. Mostly the test is named from the digit used and the site selected (see finger-to-finger; finger-to-nose). When the term "past-pointing" is used by itself, it generally refers to the following procedure performed in association with the Barany Tests.

Procedure: With the patient seated, the examiner stands in front of the patient holding the index fingers together in the form of a "V" at the level of the patient's waist and some two feet or more anterior. The patient is instructed to observe the center of the "V" and then to hold the arm straight out with the index finger pointing forward and to bring the finger from a level above the head to the center of the examiner's "V" shaped fingers with the eyes closed. Normally the patient can do this with great accuracy, not deviating more than an inch to either side (Figs. 111 A & B).

Significance: The patient's finger will deviate significantly to the side of Vestibular Disease (see also Barany Tests).

Figure 112 A

Figure 112 B

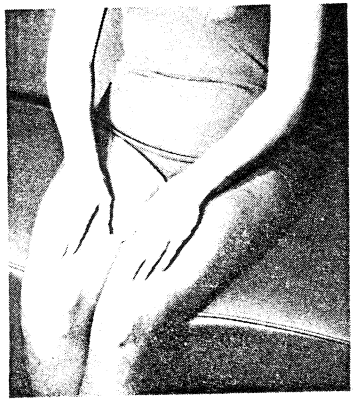


Figure 112 C

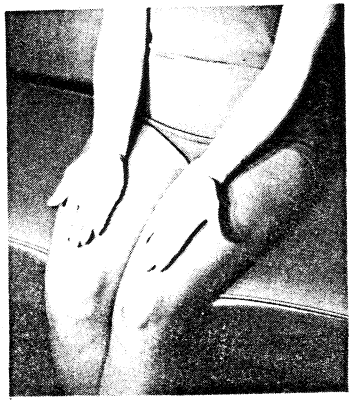


Figure 112 D

PATTING: Test

Procedure: The patient is requested to pat rapidly with each hand; the examiner's hand, one of his hands with the other, or his own leg. He may also be asked to alternate the pats with his palmar and dorsal surface. Normally this is performed smoothly with even amplitude and regular rhythm (Figs. 112 A, B, C & D).

Significance: Irregularity of amplitude and rhythm is a sign

of Cerebellar disease.

Figure 113 A

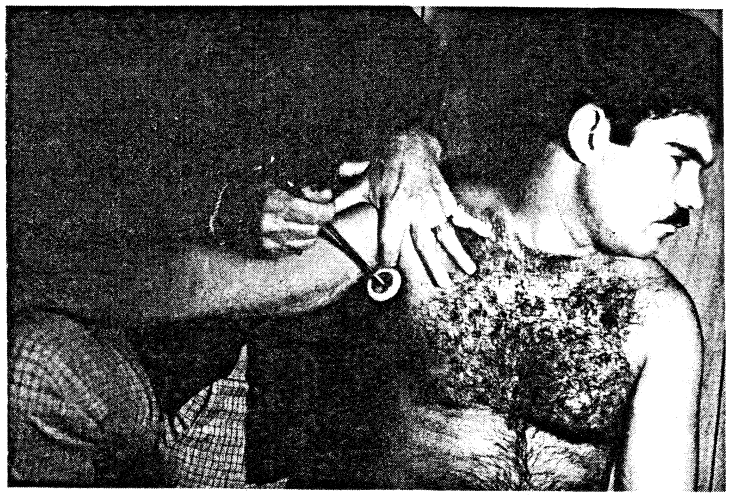


Figure 113 B

PECTORAL: Reflex

Procedure: With the patient's arm placed halfway between adduction and abduction, the examiner places his index

finger over the anterior fold of the axilla hooking the tendon of the Pectoralis Muscle (Fig. 113 A) and strokes it with a reflex hammer (Fig. 113 B). Normally there is little, if any, contraction of the muscle causing some adduction and slight internal rotation of the am (due to the multiple nerve roots serving it).

Significance: If the resulting contraction is brisk and excessive as compared to the opposite side, this is evidence of a Corticospinal Tract lesion above the level of the fifth cervical segment.

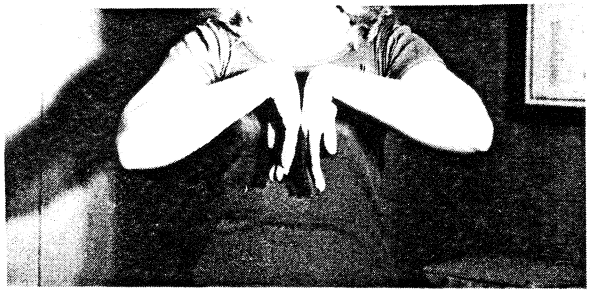


Figure 114

PHALEN (PHELAN): Sign

When the wrist is held in complete flexion for from 30 to 60 seconds and symptoms of discomfort, numbness and tingling paresthesiae are reproduced or exaggerated in the hand and digits, the sign is present (Fig. 114).

Significance: Median Nerve compression as in the Carpal Tunnel Syndrome.

Synonym: Prayer Sign

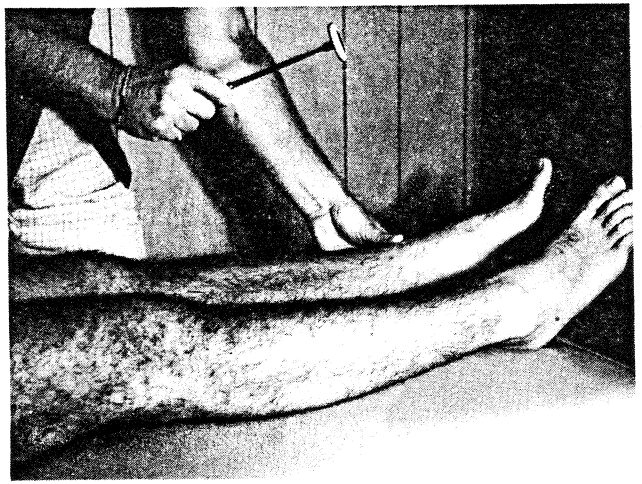


Figure 115 A

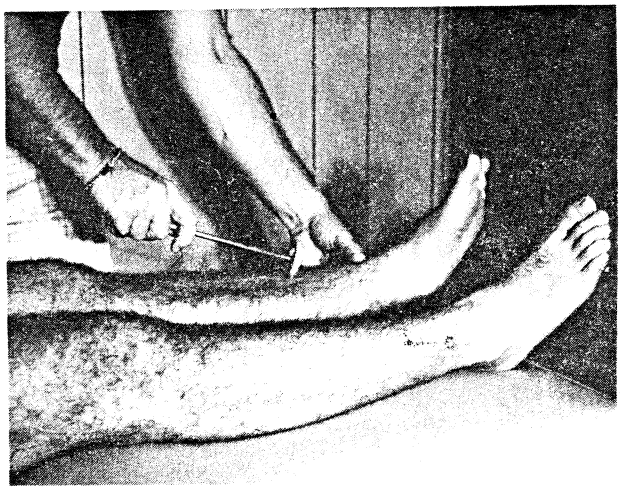


Figure 115 B

PIOTROWSKI'S: Sign/Reflex

The sign is present when tapping over the Tibialis Anticus Muscle produces excessive dorsiflexion and inversion (sole in) of the foot when compared to the contralateral side (Figs. 115 A & B).

Significance: Organic disease of the central nervous system.

Synonyms: Anticus Sign or Reflex.

PITRES': Sign (not illustrated)

Loss of deep pain from pressure on the testis

Significance: see ABADIE'S Sign

Figure 116 A

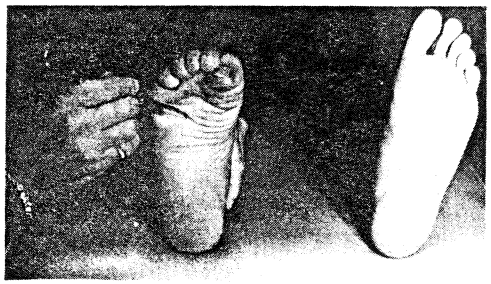


Figure 116 B

PLANTAR: Reflex

Procedure: Patient's position is supine with the lower limbs and trunk straight and symmetrical. The examiner while

holding the patient's foot to prevent withdrawal uses a blunt object and strokes lightly along the lateral margin of the foot starting at the heel and stopping short of the base of the toes. Normally the great toe and frequently the others flex (Figs. 116 A & B).

Significance: A superficial reflex, loss of which represents a lesion at or above segmental spinal cord levels S1 & S2 or a lesion of the Tibial Nerve.

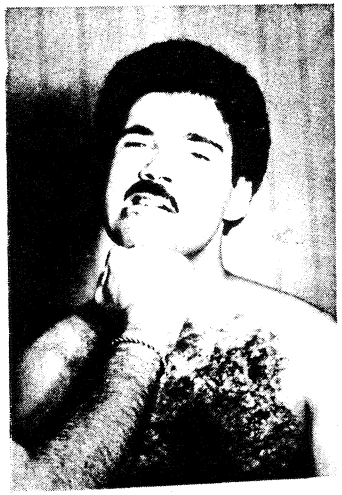


Figure 117

PLATYSMA: Sign

If resistance by the examiner is applied to the patient's flexing the chin against the chest or to opening the mouth, the Platysma on the sound side only, will contract drawing the outer part of the lower lip downward and backward, and widening the aperture at the corners of the mouth as in an expression of horror (Fig. 117).

Significance: Is a pathologic reflex of the head denoting ipsilateral corticospinal tract disease and is seen in

Hemiplegia.

Synonym: Babinski's Platysma Reflex

Figure 118 A

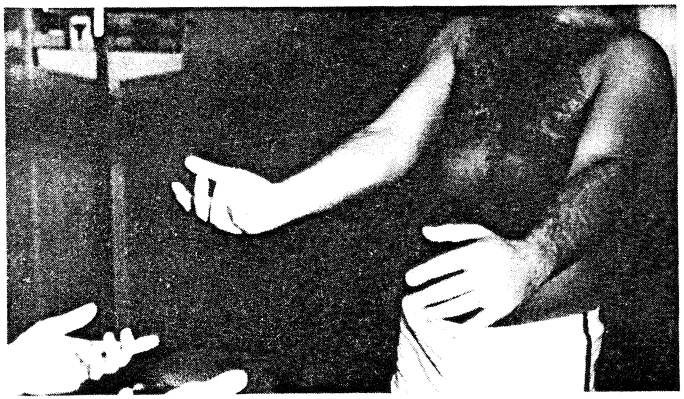


Figure 118 B

Left Upper Limb Paralysis

PRONATION: Sign

When both forearms of the patient are placed in supination by the examiner and one is paralysed, the sound limb will stay in supination while the paralysed limb turns over toward pronation (Figs. 118 A & B).

Significance: A confirmation of organic paralysis

Synonym: Babinski's Pronation Sign (see STRUMPELL'S Pronation Sign)

Figure 119 A

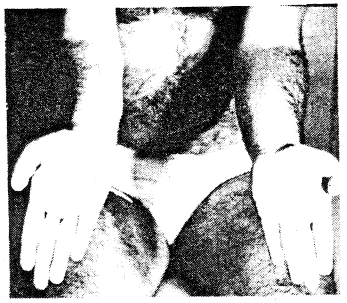


Figure 119 B

Figure 119 C

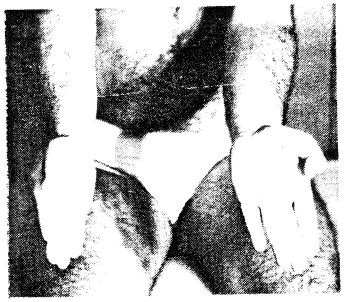


Figure 119 D

Left Upper Limb Lesion

PRONATION-SUPINATION: Test

Procedure: With the arms extended in front, the patient is asked to pronate and supinate them as rapidly as possible using the elbows as a fulcrum (Figs. 119 A & B). The hands are tested separately and together. Under normal circumstances the movements are of equal amplitude, smooth and even, there is no tendency on the part of the arms to drift outward or inward (Figs. 119 C & D).

Significance: The tests are for dystaxia-dysmetria of Cerebellar disease, the dystaxic hand overshoots one time,

undershoots the next, is slower than its counterpart and drifts.

Synonym: Rapid-alternating Movements Test

PUPILLARY: Reflex (see illustration for Consensual reflex)

Procedure: With the patient looking at a distance over the examiner's shoulder, a light is shined in either pupil. Normally the pupils contract immediately and rapidly both directly and consensually. Care must be taken that the stimulus comes from outside the direct vision of the patient so that pupillary contraction because of accommodation is not confused with that of light stimulation.

Significance: Loss of this reflex indicates a lesion of the Optic afferents, or the Oculomotor efferents or their nuclei.

Synonym: Direct Light Reflex

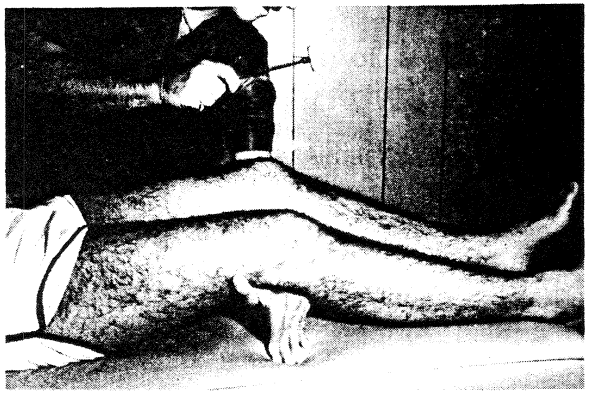


Figure 120 A

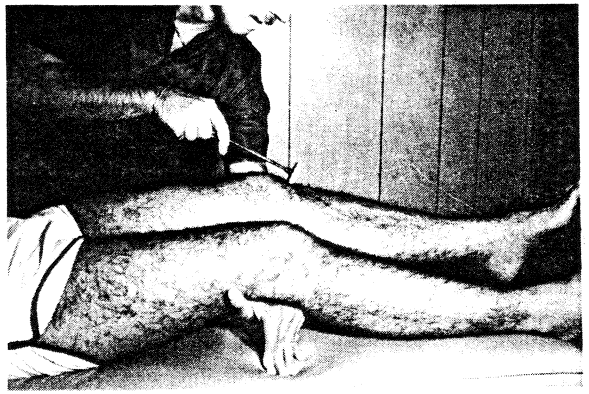


Figure 120 B

QUADRICEPS: Reflex

Procedure: The supine position because of near complete relaxation without unequal muscle tension is the optimum position although the reflex can be taken in various postures. Both lower limbs are parallel, extended and side by side. The examiner places the dorsum of his forearm under both popliteal spaces and slightly elevates the knees together. Palpating the patellar tendons he then briskly strokes each equally with a reflex hammer monitoring and comparing quantitatively the response of the Quadriceps contractions and knee extensions both visually and palpably (Figs. 120 A & B). If the response is difficult to elicit, Jandrassik's Reinforcement Maneuver can be used.

Significance: Loss of the reflex (Westphal's Sign) may indicate a lower motor neuron lesion of L2, 3 or 4 nerve roots or of the Femoral Nerve. Exaggeration of the reflex may indicate an upper motor neuron lesion at or above lumbar spinal segments 2, 3 or 4.

Synonyms: Knee Jerk Reflex; Patellar Reflex

Note: Westphal's Sign is characteristic of Tabes because of

sensory loss but may be seen in lower motor neuron lesions.

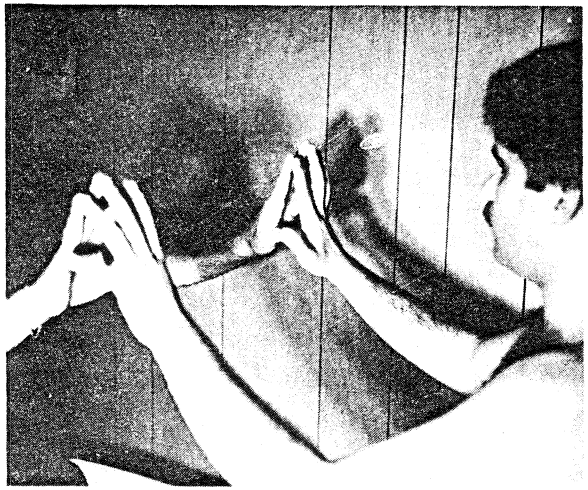


Figure 121

QUINQUAUD'S: Sign

When the patient's fingers are spread and the fingertips pressed against those of the examiner, the hands held vertically, a series of slight shocks are felt after a few seconds, as if the phalanges of each finger were knocking together (Fig. 121).
Significance: A sign of Chronic Alcoholism

Synonym: Toxic Tremor Sign

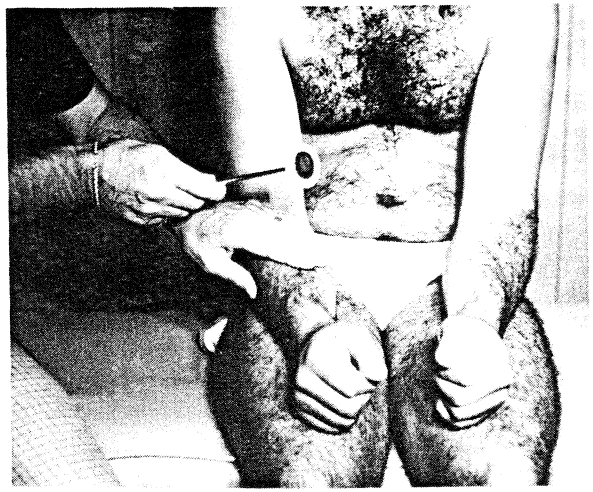


Figure 122 A

Figure 122 B

RADIAL: Reflex

Procedure: The patient is seated with his forearms resting on the thighs and the hands midway between pronation and supination with the radii superiorward. Other positions, e.g. forearms resting on the abdomen, examiner supporting the

forearms, etc. may be used. The examiner initially taps the forearm over the radius starting just proximal to its styloid process and working up the lower third of the radius to find the point of maximum response, which is then compared with its symmetrical counterpart. The normal response is slight supination, flexion and radial deviation of the hand (Figs. 122 A & B).

Significance: The reflex is a test of C5-6 segmental integrity, an absent or decreased reflex indicating a lower motor neuron lesion, an exaggerated reflex indicating an upper motor neuron lesion when in the presence of associated standard criteria.

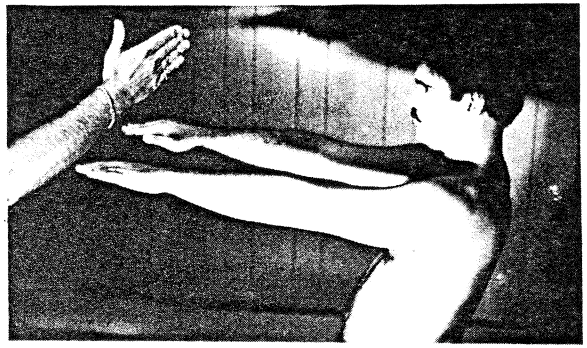


Figure 123 A

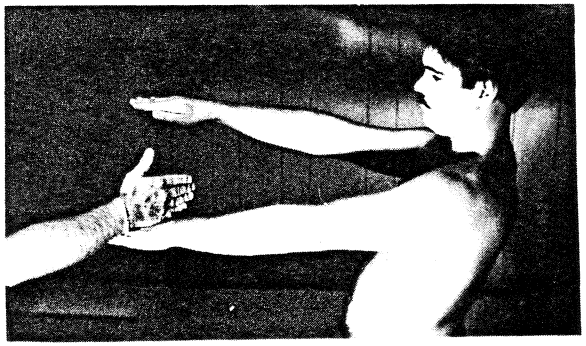


Figure 123 B

REBOUND AND CHECKING: Test

Procedure: The patient stands with outstretched arms, eyes closed. The patient is instructed that the examiner is going to "bump" his arms and that the patient should hold them still and not let them be moved. The examiner then strikes the back of the patient's wrist with a sharp blow, strong enough to displace the arm. The normal subject's arm returns quickly to its initial position, the test is positive for pathology when the patient's arm oscillates back and forth; it rebounds several times or the maneuver throws the patient off balance (Figs. 123 A & B).

Significance: Cerebellar disease (see Holmes Sign)

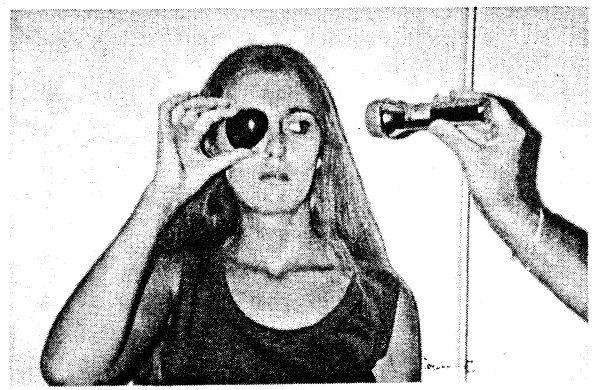


Figure 124

RED GLASS: Test

Is a test used if the eye muscle responsible for diplopia is only slightly paretic and cannot be readily identified. The patient is asked to look at a light after a red glass is placed in front of one eye, thus two images are seen, a red light by one eye and a white light by the other. The examiner then takes the light through the cardinal positions of gaze the patient describing the degree of separation between the two images in each

position and reporting that position where maximum image separation occurs (Fig. 124).

Significance: The eye that lags (the weak eye) projects the image farthest in its direction of gaze, or stated another way, the more peripheral of the double images belongs to the paretic eye.

RIGHTING: Reflexes (no illustration)

Mechanisms seen best in the infant by which the patient attempts to bring the body and head into normal position by means of labyrinthine, neck, optical, body-to-head and body-to-body reflexes.

See Cantelli's Sign; Landau's Reflex; Moro's Reflex and Tonic Neck Reflexes.

Figure 125 A

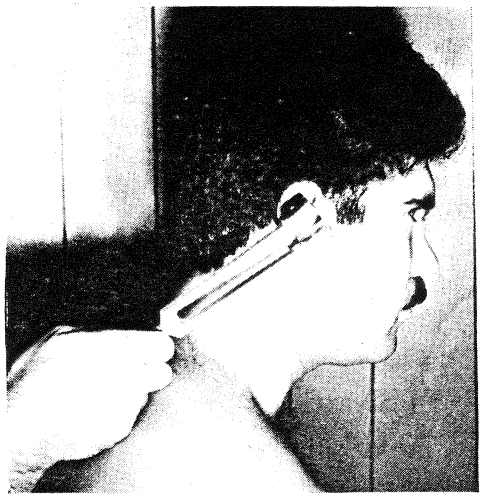


Figure 125 B

RINNE: Test

A 256 cycle or a 512 cycle tuning fork is vibrated and the stem placed on the patient's mastoid process of the Temporal Bone (Fig. 125 A). The patient reports when the sound can no longer be heard. The tuning fork at this time is placed uninterrupted in front of the patient's ear approximately one-half inch from the external auditory meatus (Fig. 125 B) until it is no longer heard. The test may be performed alternating the two positions.

If the sound is heard longer at the external auditory meatus (air conduction) it is designated: Rinne Positive or+R.

If the sound is heard equally long at both positions it is designated as Rinne Equal.

If the sound is heard longer on the mastoid process (bone conduction) it is designated Rinne Negative or -R.

Significance: +R is normal; Rinne Equal or -R indicates a mechanical obstruction in the airway or middle ear disease. In severe nerve deafness no sound is heard in either case.

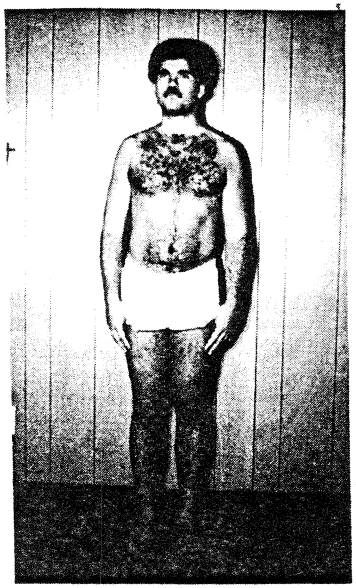


Figure 126 A

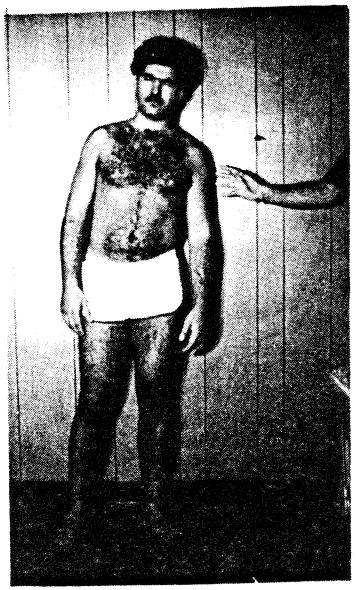


Figure 126 B

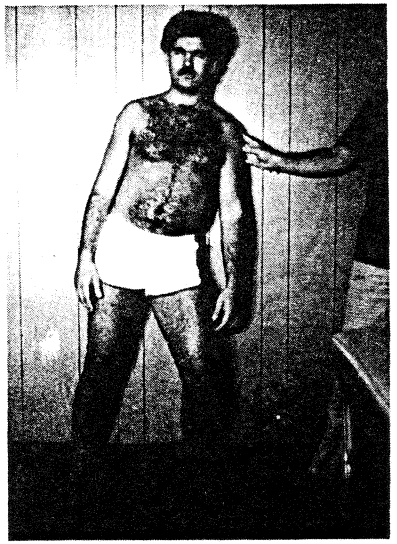


Figure 126 C

ROMBERG: Sign

The patient is directed to stand upright with the feet together and the arms at the sides. Care must be taken to be close enough to catch the patient if he falls. If he does this well, he is directed to close the eyes. A slight amount of swaying is to be expected normally. But if, upon closing the eyes, the patient falls or has to move the feet to retain balance (one or the other is necessary), the sign is present (Figs. 126 A, B & C).
Significance: The sign is present in spinal cord Posterior Column disease notably Mutliple Sclerosis and Tabes.

Note: The sign is absent in Cerebellar or Labyrinthine disease, for, although the patient is likely to stand poorly in either case, he stands equally well with or without the utilization of vision.

Synonym: Station Test

Figure 127

ROOTING: Reflex

Procedure: The examiner with the finger covered for sterile

purposes, places the tip at the side of the cheek, at the corners of the mouth or on the upper or lower lips of the infant, causing the infant to open the mouth and turn the face to the stimulus so as to follow it (Fig. 127).

Significance: The reflex is normal in infants up to six months, absence indicates a Trigeninal or Facial Nerve lesion.

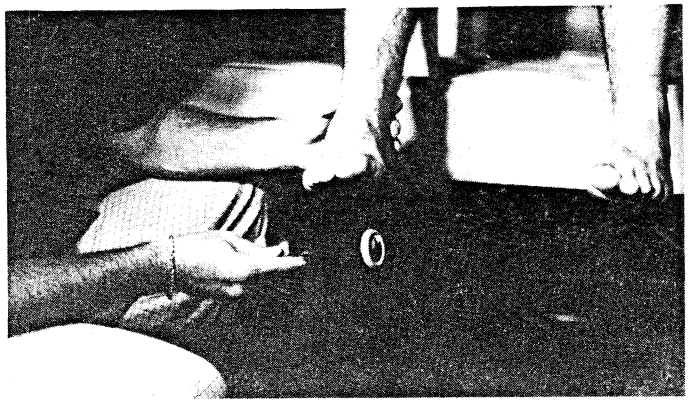


Figure 128 A

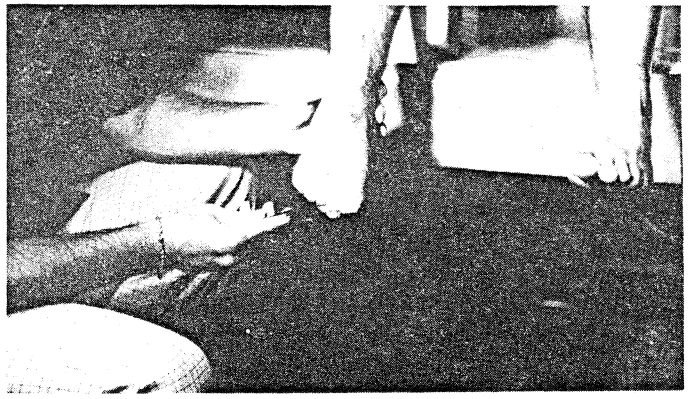


Figure 128 B

ROSSOLIMO: Reflex

Procedure: In the optimum position the patient is seated with

the legs dangling and feet well above the floor (Fig. 128 A). The examiner taps the balls of the toes two or three times in different places to elicit plantar flexion of the toes (Fig. 128 B).

Significance: An inconstant and sometimes unreliable sign (pathologic reflex) occurring late in the development of Pyramidal Tract disease. See Mendel-Bechterew.

Synonym: Toe Flexion Reflex

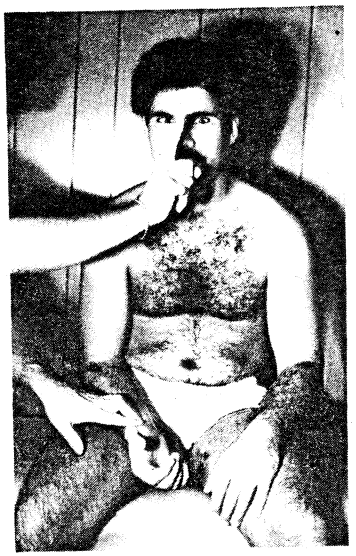


Figure 129 A

Figure 129 B

RUGGERI'S: Reflex

Procedure: The examiner while palpating or otherwise monitoring the patient's pulse, directs the patient to look intently upon some object, usually the examiner's index finger, not to look away from it and to follow it wherever it is placed. By bringing the object very close to the eyes and causing strong convergence of the eyeball there is acceleration of the pulse (Figs. 129 A & B).

Significance: The presence of this reflex indicates Sympathetic Nervous System excitability or emotional instability.

Figure 130 A

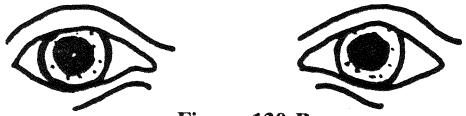


Figure 130 B
Pupil Reflex Absent

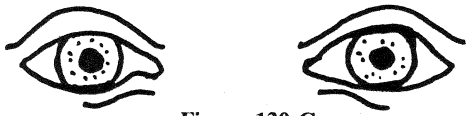


Figure 130 C
After Short Time in Darkness

SAENGER'S: Sign

A direct light reflex of the pupil that has been absent, returns after the patient spends a short amount of time (about five minutes) in complete darkness (Figs. 130 A, B & C).

Significance: The sign is observed in Syphilis of the brain (cerebral) but not in Syphilis of the spinal cord (Tabes).

Figure 131 A

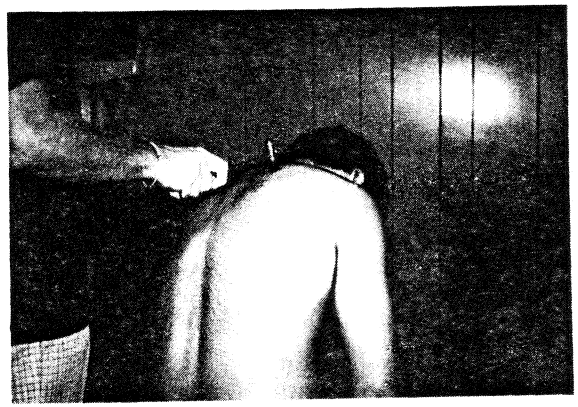


Figure 131 B

SCAPULOHUMERAL: Reflex

Procedure: The patient is positioned either prone with both arms hanging over either side of a table or couch, or seated with the upper trunk bent forward and the arms hanging limply along the sides of the body. The examiner using a reflex hammer strokes the area just medial to the vertebral border of the scapula from above the scapular spine to its

inferior border seeking that area of maximum response which when percussed will cause contraction of those muscles retracting the shoulder and abducting the arm (Figs. 131 A & B).

Significance: Unilateral hypo- or hyper-reflexia of muscles supplied by fibers of cervical nerve roots C5-6 may indicate a lower or upper motor neuron lesion when accompanied by the other standard criteria.

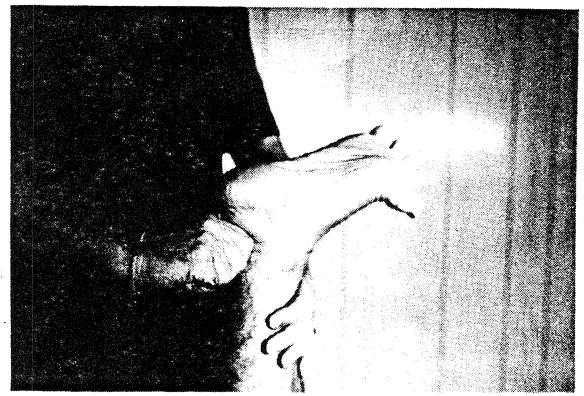


Figure 132

SCHAEFER'S: Reflex

A Babinski-like toe sign seen on pinching or squeezing the Tendo Achillis at a level parallel with the apex of the internal malleolus (Fig. 132).

Significance: Is a pathologic reflex indicating corticospinal (pyramidal) tract pathology.

Figure 133

SEELIGMULLER: Sign

Mydriasis (dilated pupil) on the side of the face afflicted with neuralgia (Fig. 133).

Significance: This sign is absent in hysteria or malingering.

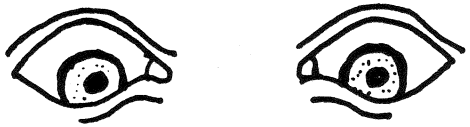


Figure 134

SETTING SUN: Sign

Downward deviation of the eyes of an infant so that each iris appears to "set" (or seems to be going down) beneath the lower lid with the white of the sclerae significantly exposed between the pupil and the upper lid (Fig. 134).

Significance: The sign indicates intracranial pressure from hemorrhage or inflammation; or irritation of the brain stem as in Kernicterus.

SLOW CEREBRATION: Sign (no illustration)

The apparently attentive patient lies quietly as the examiner asks a question. The patient does not answer, but, after approximately ten to thirty seconds, as the examiner prepares to repeat the question, concluding that no response is

forthcoming, the patient responds slowly, deliberateiy and accurately.

Significance: Increased cerebral reaction time, the sign is almost pathogomonic of an intracerebral abscess.

Synonym: Macewen's Sign

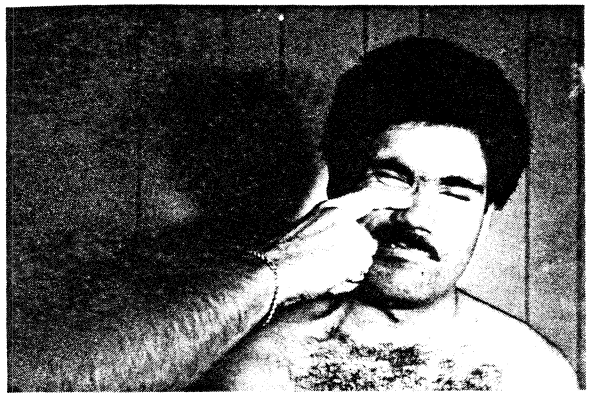


Figure 135 A

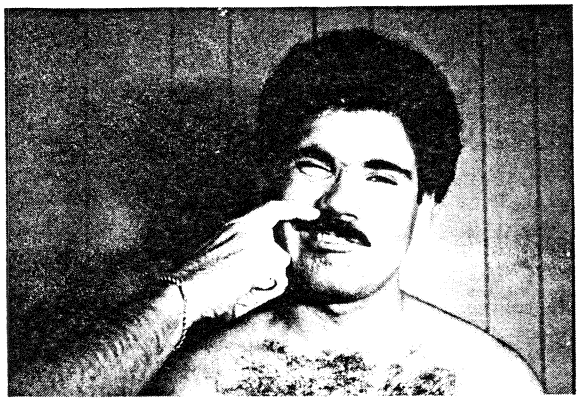


Figure 135 B

SNOUT: Reflex

Sharp tapping (usually with the index finger) of the nose or of

the middle of the upper lip produces either an excessive grimace of the face or an exaggerated reflexion contraction of the lips (Figs. 135 A & B).

Significance: Is a pathologic reflex of the head most frequently seen in bilateral corticopontine lesions and represents an upper motor neuron lesion.

Figure 136 A
(Deep Inspiration)

Figure 136 B
(Deep Expiration)

SOMAGYI'S: Reflex

Widening of the pupils upon deep inspiration (Fig. 136 A) and constriction of the pupils upon expiration (Fig. 136 B).

Significance: The reflex when seen indicates irritation or instability of the Cardiac Vagus.

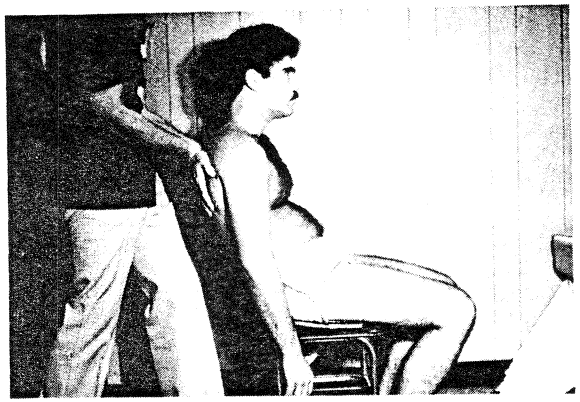


Figure 137 A

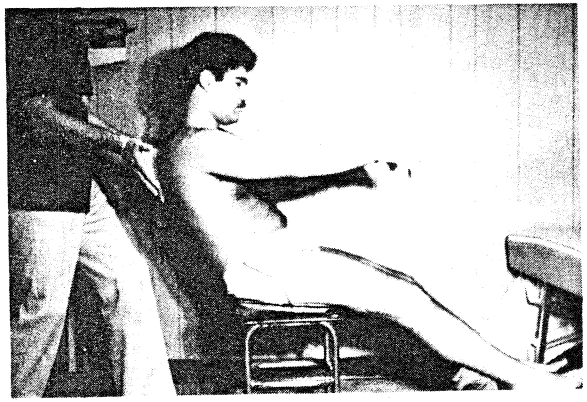
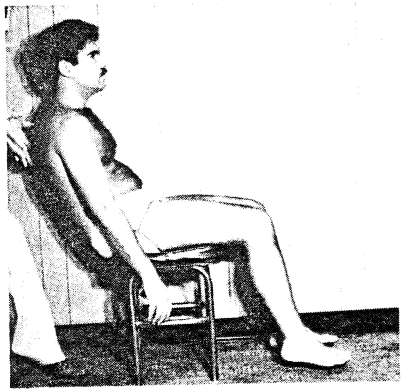


Figure 137 B
Normal Response



Souques' Sign

SOUQUES': Sign

The patient seated, leans back against support provided by the examiner (Fig. 137 A) who then suddenly removes this support; while momentarily falling back the patient's lower extremities do not extend normally or otherwise move in an attempt to counteract the loss of balance (Figure 137 B).

Significance: When the sign is present it indicates advanced Extrapyramidal System (Basal Ganglia) disease of the Striatum.

Figure 138 A

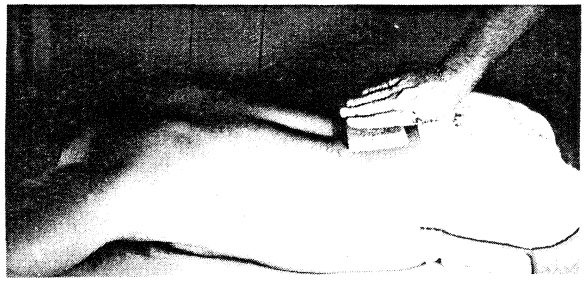


Figure 138 B

SPONGE: Test

A hot sponge is passed up and down the spine bilaterally several times; if any lesion of the spine is present, pain is felt as the sponge passes over its locality (Figs. 138 A & B).

Significance: The test is positive in acute inflammatory lesions of the spine.

Figure 139 A

Figure 139 B

STRANSKY: Reflex

Procedure: The examiner gives firm, forceful and sudden abduction of the little toe (Fig. 139 A), holds the abduction to the count of two and then suddenly releases it. Accompanying this procedure or immediately following it is dorsiflexion of the great toe (Fig. 139 B).

Significance: A pathologic reflex indicating an upper motor neuron lesion of the Pyramidal Tract.

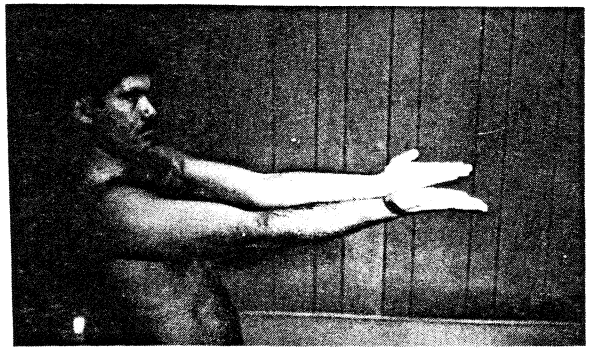


Figure 140 A

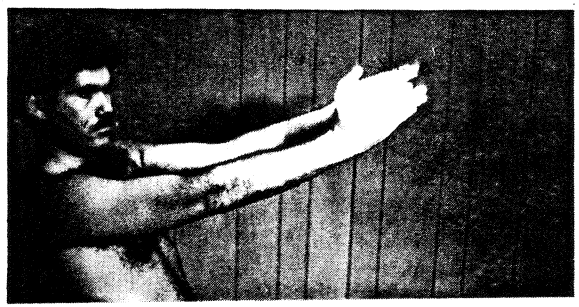


Figure 140 B

STRUMPELL'S PRONATION: Sign

With the palms facing superiorward (Fig. 140 A) the patient in

either flexing the elbows or anteriorly elevating the arms is unable to keep the affected (paretic) limb from drifting into pronation (Fig. 140 B).

Significance: Is an upper limb pathologic reflex indicating an upper motor neuron lesion, e.g. Hemiplegia.

Synonym: Pronator Sign

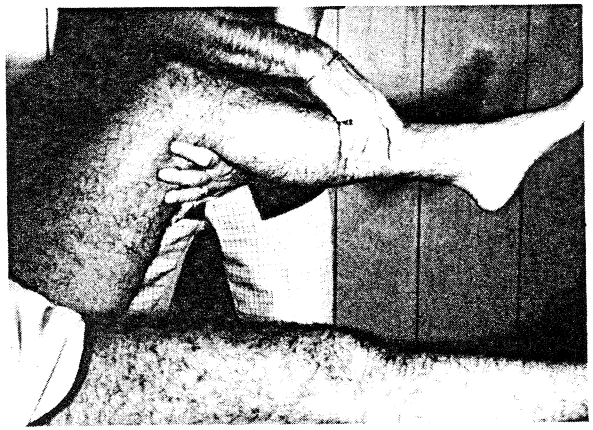


Figure 141 A

Figure 141 B

Figure 141 C

STRUMPELL'S TIBIALIS ANTERIOR: Sign

Procedure: With the patient supine, the examiner places one hand under the patient's knee in the popliteal space and the other hand over the middle anterior tibial third (Fig. 141 A). The examiner then, 1. strongly flexes the hip on the pelvis with the popliteal placed hand (Fig. 141 B) and, 2. then firmly flexes the knee with the other hand (Fig. 141 C). The sign is present when the maneuver causes dorsiflexion and often adduction of the foot on 1. or on 2.

Significance: The sign is seen in an upper motor neuron lesion (Spastic paralysis) of the lower limb and is a confirmatory sign of a previously elicited pathologic reflex.

Synonym: Tibialis Sign.

Figure 142 A

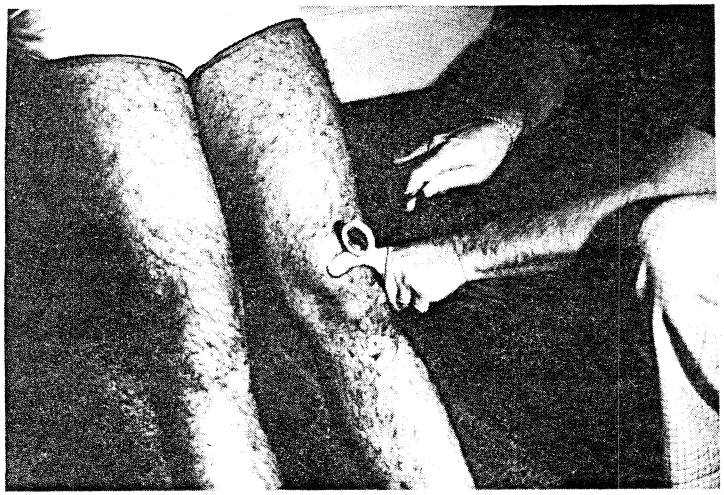


Figure 142 B

SUPRAPATELLAR: Reflex

Procedure: The patient is supine and relaxed on an examining table, both lower limbs are straight and parallel. The examiner crooks his index finger around the superior half of

the patella and exerts firm downward pressure on the patella toward the feet (Fig. 142 A). The superior portion of the patella is then stroked posteriorward and toward the feet with a reflex hammer, the index finger acting as a pleximeter (Fig. 142 B). Normally there is a rebound "kickback" response of the patella for each single percussion.

Significance: More than one patellar kickback for a single percussion stroke indicates suprapatellar clonus which is one of the criteria for an upper motor neuron lesion. When the patella goes into a rapid up and down movement (patellar clonus) it is called The Trepidation Sign.

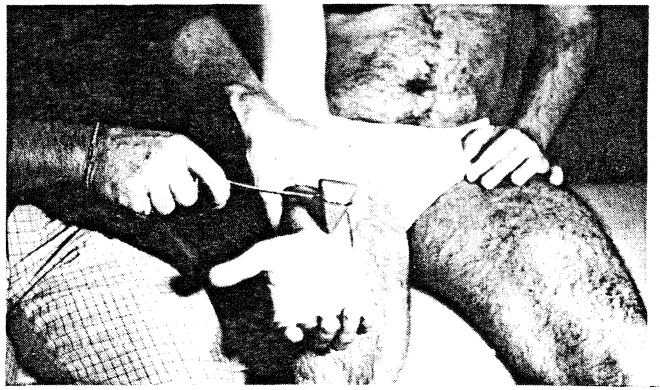


Figure 143

TINEL: Sign

The sign is elicited by gentle percussion with the finger or a reflex hammer over the site or along the course of an injured nerve. A transient, often painful, tingling sensation is experienced by the patient in the distal distribution of the injured nerve (rather than at the area percussed) which persists for several seconds when the sign is present (Fig. 143).

Significance: Initially the sign is a differentiation between

complete (where no distal sensation would be felt) and partial (where some distal conduction is still preserved) peripheral nerve interruption. If elicited along a nerve which previously had been negative to conduction, the site of the distal extent may be taken roughly as the point to which the nerve fibers have regenerated.

Synonyms: Formication Sign; Distal Tingling on Percussion (D.T.P.) Sign; Hoffman-Tinel Sign.

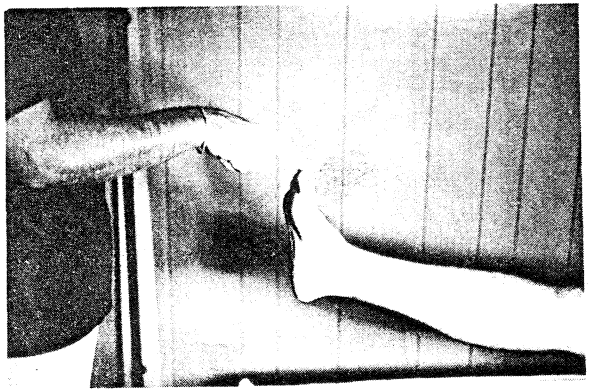


Figure 144 A

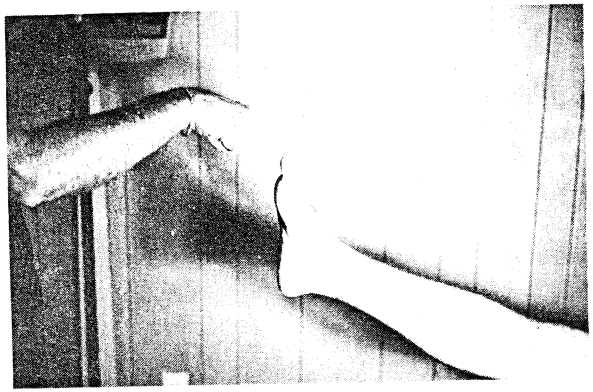


Figure 144 B

TOE-FINGER: Test

The supine patient touches the examiner's finger with his or her great toe and holds it there (Fig. 144 A) until the examiner moves the finger to a new position approximately 6 to 18 inches away, the patient then following the examiner's finger with the toe (Fig. 144 B).

Significance: Inability to perform this maneuver accurately in the absence of any weakness indicates disturbance of the Proprioceptive System, eliciting either the dysmetria (failure to hit the mark) of Posterior Column disease or the dyssynergia (imperfect coordination) of a Cerebellar lesion.

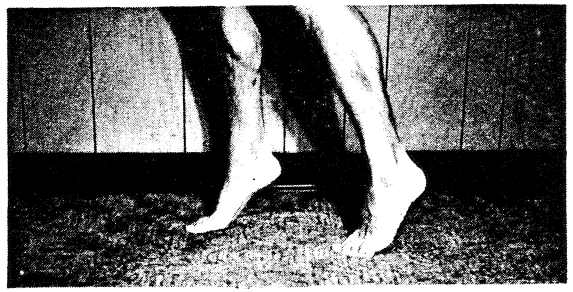


Figure 145

TOE WALK: Test

The patient is asked to stand on the toes and walk approximately seven steps away from the examiner, turn, still standing on the toes, and walk seven steps back. The normal patient, after being shown how to do it, performs this test easily (Fig. 145).

Significance: The test checks the integrity of fibers from S1-2 nerve roots.

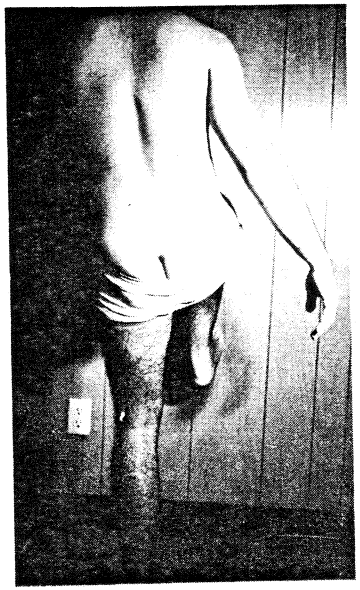
Figure 146 A

Figure 146 B

TONIC NECK: Reflex

Procedure: With the infant or child supine and quiet, the examiner gently but firmly turns only the head to one side, holding it there for at least 30 seconds. The normal result is that of extension of the upper and lower extremities on the jaw side and flexion of the extremities on the occipital side. It is the posture of a fencer making a lunge (Figs. 146 A & B). Deviation of the head without rotation also causes extension of extremities on the jaw side and contralateral extremity flexion.

Significance: This reflex is interpreted as a primitive movement pattern. It disappears as cerebral pathways establish dominance over the primitive reflexes. It is most prominent between the ages of 2 to 4 months. Its loss during the early several months of birth or any undue persistence either when spontaneously assumed by the infant or induced by the examiner shows abnormal motor development.



Normal
Figure 147 A

Trendelenburg Sign
Figure 147 B

TRENDELENBURG: Test

Procedure: The patient, stripped, and with his back to the examiner is asked to stand on one limb and lift the other knee above his waist. This is performed on both sides. The position and movements of the gluteal fold are observed. A positive test is when the gluteal fold on the raised side falls instead of rising. Normally the hip abductor muscles on the standing leg side contract to raise the contralateral side of the pelvis (Figs. 147 A & B).

Significance: Weakness of the hip abductors (Gluteal insufficiency) on the standing side is indicated by a positive test.

Figure 148 A

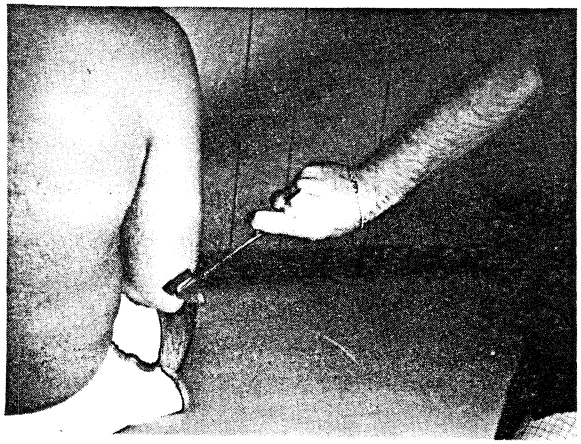


Figure 148 B

Figure 148 C

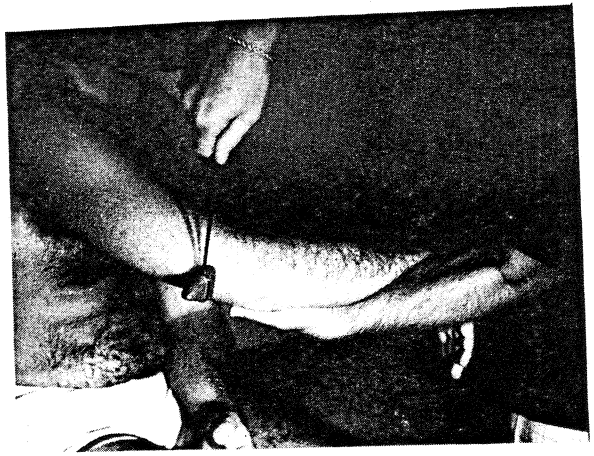


Figure 148 D

TRICEPS: Reflex

Procedure: The patient is seated with the elbows at right angles, lower forearms crossed and resting on the thighs; the arm to be tested is uppermost (Fig. 148 A). The Triceps tendon is stroked directly in the center by a reflex hammer with a brisk contraction of the Triceps muscle resulting normally

(Fig. 148 B). The examiner can also monitor the reflex by lightly palpating the belly of the muscle during the stroke (Fig. 148 C). If the arm is supported there is normally extension of the elbow (Fig. 148 D).

Significance: The reflex tests the integrity of nerve fibers from C7-8 nerve roots. See Radial and Biceps Reflexes.

Synonym: Triceps Brachii Reflex

Figure 149 A

Figure 149 B

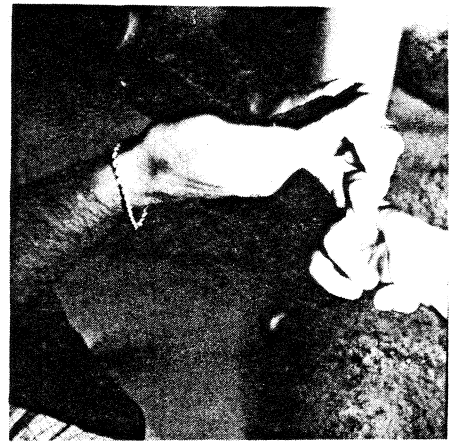


Figure 149 C

TROMNER'S: Sign

The patient's hand is relaxed and supported in pronation by the examiner who is holding onto the proximal phalanx of the middle finger (Fig. 149 A). The examiner briskly flips the patient's distal phalanx upward by tapping the palmar surface with his middle finger as though trying to flip a handful of water high into the air (Fig. 149 B). The sign is present when this maneuver elicits flexion of all the fingers including the thumb (Fig. 149 C).

Significance: See Hoffman's Reflex

Synonym: Finger Flexion Reflex; Tromner's Method

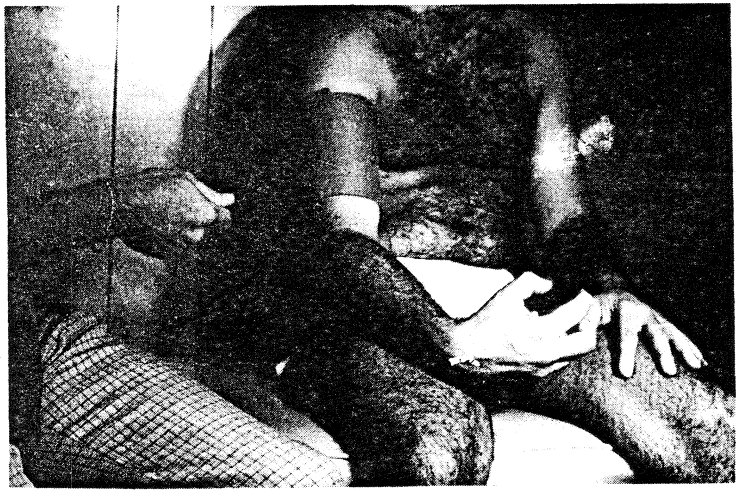


Figure 150

TROUSSEAU'S: Sign

Compression of the arm by manual squeezing or constriction by a tourniquet as with a blood pressure cuff at a compression just enough to eliminate pulsations of the Brachial Artery is followed by spasmodic contractions of the hand and forearm (Accoucheur's Hand). There may be a latent period of one to four minutes (Fig. 150).

Significance: Is a conclusive sign of Tetany but is not always present. See Erb's Sign.

Figure 151 A

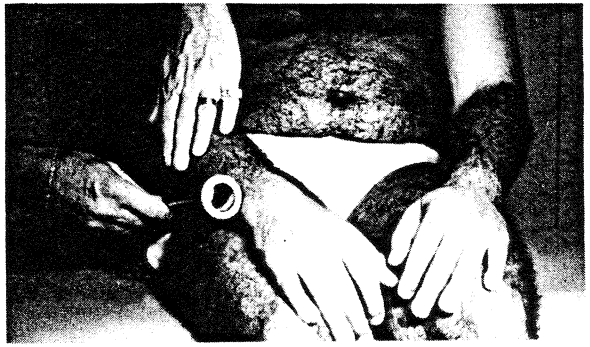


Figure 151 B

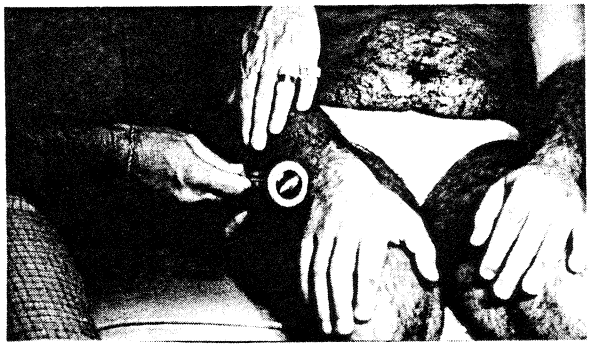


Figure 151 C

ULNAR: Reflex

Procedure: The patient is seated, relaxed with elbows at right

angles, forearms and wrists on the thighs with palms facing downward (Fig. 151 A). The examiner while lightly palpating the ulnar musculature with one hand, strokes the styloid process of the ulna just proximal to its apex with a somewhat glancing blow (Fig. 151 B) from medial to lateralward. Normally the reflex will show minimal pronation and ulnar deviation (abduction) of the hand (Fig. 151 C).

Significance: A stretch reflex which tests the afferent and efferent fibers of the Ulnar nerve through their center C8 and T1.

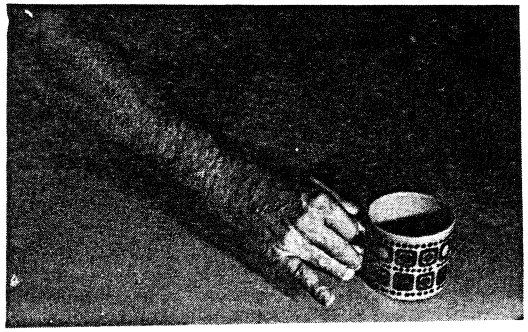


Figure 152 A

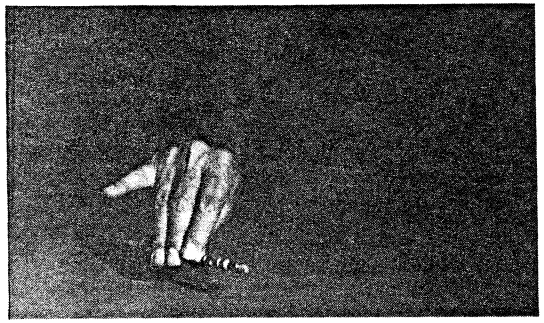


Figure 152 B

WARTENBERG'S: Sign

In normal hand posture and movements, the little finger

assumes a position of significant abduction (Figs. 152 A & B).

Significance: Ulnar Nerve palsy

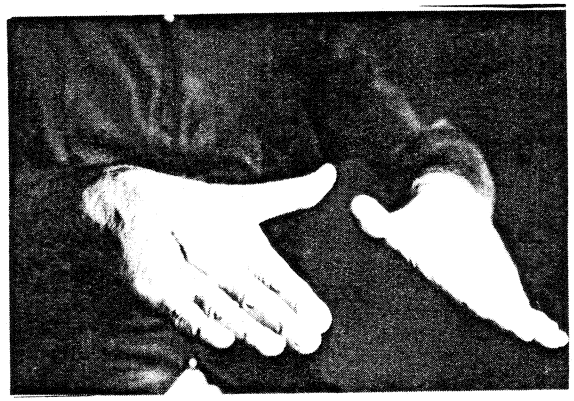


Figure 153 A

Figure 153 B

WARTENBERG'S (Oriental Prayer): Sign

The patient is directed to extend and adduct the four fingers of each hand and also to extend the thumbs (Fig. 153 A). Then the patient is asked to raise both hands in front of his face so that they are side-by-side in the same plane with thumbs and index fingers touching tip-to-tip. If there is paralysis of the Abductor Pollicis Brevis, the thumbs will not coincide when

the index fingers touch (Fig. 153 B).

Significance: Median Nerve palsy

Figure 154 A

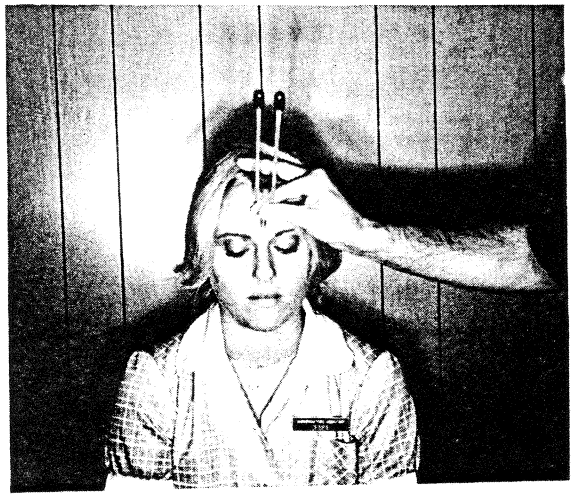


Figure 154 B

WEBER (Lateralization): Test

Procedure: The patient is seated, the examiner standing alongside vibrates a 256 tuning fork and places the stem on the patient's vertex (Fig. 154 A) or on the midline of the forehead (Fig. 154 B) just above the glabella. If the sound is heard equally on both sides or "all over" it is expressed as "Weber Negative" and is a normal response. If the sound is heard more on one side (lateralization) it is expressed as "Weber Right" or "Weber Left" relative to the side on which it is best heard.

Significance: If the sound is referred to the poorer hearing ear it indicates loss of hearing due to blockage of the air passages on that side; if the sound is referred to the better hearing ear it indicates nerve deafness (poor function of the Auditory Nerve or the Cochlea) on the opposite side.

Figure 155 A

Figure 155 B

Figure 155 C

WRIST: Reflex

Procedure: With the patient seated and relaxed, the examiner holds the patient's wrist and hand by placing one digit, either the thumb or the index finger across the palm with the other digits on the dorsal side (Fig. 155 A). The wrist is flexed slightly with the fingers in a semiflexed position (Fig. 155 B). The examiner then strokes directly the flexor surface of the wrist joint with a reflex hammer starting at the midline and then stroking on either side until the area of maximum response is percussed. A normal response showing good muscle tone is flexion of the index and middle fingers upon percussion (Fig. 155 C).

Significance: A stretch reflex testing afferent and efferent fibers from cervical nerve roots C7-8.

Figure 156

ZYGOMATIC: Reflex

Procedure: On tapping the Zygoma lightly with a reflex

hammer there is elicited lateral motion of the lower jaw to the percussed side (Fig. 156).

Significance: See Jaw Jerk

ROUTINE NEUROLOGICAL EXAMINATION

I Mental Status (Cerebral Function)

EXAMINATION PROCEDURE:	PURPOSE AND SIGNIFICANCE
Ask patient to: 1. Close eyes 2. Raise arms above head 3. Tilt head backward 4. Turn head to left	State of Consciousness (How rapidly and accurately does patient respond)
Ask patient: 1. Approximate time 2. What day was it 2 days ago 3. Time patient got up this morning	Orientation in time " "
Ask patient to close eyes and: 1. Point to doorway 2. Point to a window 3. Point to a or the light	Orientation in space " " "
Ask patient to: 1. Touch left knee with left hand 2. Then grab left wrist 3. Then grab right elbow	Orientation in person " " "
Ask patient: 1. Year of high school graduation 2. Year of college graduation 3. Last day had eggs for breakfast 4. Last day had meat for breakfast	Memory of: Past events " Recent events "
Ask patient to count backward from 100: 1. By ones (to 88) 2. By threes (to 82) 3. By sevens (to 72)	Ability to use numbers " " "

II Gait and Posture

1. Romberg Test	Spinal cord posterior columns lesions
2. Pt. takes seven steps away & seven steps back to doctor	Abnormal gait (ataxia) "
3. Pt. stands on right foot alone then on left foot alone	Equilibrium status "
4. Pt. performs tandem gait	Proprioceptive system status
5. Pt. walks away 7 steps on heels	Anterior leg strength (L4-5)
6. Pt. walks back 7 steps on toes	Posterior leg strength (S1-2)

III Skull

1. Palpation and observation	Lumps and bumps (contusions)
2. Auscultation of: Subclavian, carotid, thyroid and retro-ocular arteries	Bruits " "

IV Cranial Nerves

1. Funduscopic examination (eyegrounds)	II Optic atrophy, papilledema, etc.
2. Peripheral vision	II Visual fields
3. Central visual acuity: Reading Eyechart	II near vision II distant vision
4. Pupillary reflex	III occulomotor stimulation
5. Globe movements & Nystagmus	III, IV, VI VIII
6. Palpebral fissure equality	III & cervical sympathetics
7. Corneal reflex	V, VII
8. Sharp & dull face sensation	V
9. Eyebrow strength Show teeth	VII " "
10. Jaw muscle power	V
11. Otoscopic examination Weber lateralization test Rinnes test Whisper test	VIII VIII Cochlear division VIII Cochlear division VIII
12. Lingual reflex	IX
13. Phonation Palatal reflex	X X
14. Shoulder shrug & cervical rotation	XI
15. Tongue in midline, tongue in cheek and tongue strength	XII " "

V Upper Extremities

(Motor System)

1. Finger to nose to finger	Proprioceptive System
2. Patting test, tapping test	Adiodochokinesia (cerebellum)
3. Arm abduction	C5 Deltoideus strength
4. Elbow flexion & wrist extension	C6 Biceps & wrist extensor strength
5. Elbow extension & wrist flexion	C7 Triceps & wrist flexor strength
Finger extension	" Digital extensors
6. Finger flexion	C8 Digital flexors
7. Finger abduction	T1 Digital abductors
8. Passive arm, elbow, wrist and digital movements	Joint range of motion restrictions " "
9. Palpation: shoulder, arm and forearm flesh	Muscle bulk & tone " "
10. Reflexes (deep): biceps, triceps	Hypo. vs. hyper-reflexia - Upper vs.
radial, wrist & ulnar	Lower motor neuron lesion
Hoffmann, Tromner	Pyramidal (cortico-spinal) tract lesion

(Sensory System)

11. Digital position sense, Tuning fork over bony prominences	Deep position sensation (posterior columns)
12. Pinprick (sharp & dull sensation)	Pain sense (Spinothalamic tracts)
13. Object identification by touch	Stereognosis

VI Lower Extremities

(Motor System)

1. Heel to knee down shin	Proprioception
2. Hip flexion	L2-3 Iliopsoas strength
3. Hip extension	L4-5 Glutius Maximus strength
4. Knee extension	L3-4 Quadriceps strength
5. Knee flexion	L5-S1 Hamstring strength
6. Ankle extension	L4-5 Anterior crural strength
7. Ankle flexion	S1-2 Gastrocnemius strength
8. Passive hip, knee, ankle and digital movements	Joint range of motion restrictions " "
9. Palpation: thigh & calf flesh	Muscle bulk & tone
10. Reflexes (deep) Hamstring, patellar and ankle	Hypo & Hyper-reflexia - Upper vs Lower motor neuron lesion
11. Babinski, Oppenheim, Chaddock	Pyramidal (Cortico-spinal) tract lesion

(Sensory System)

12. Digital position sense Tuning fork over bony prominences	Deep position sense (posterior columns) " "
13. Pinprick (sharp & dull sensation)	Pain sense (Spinothalamic tracts)

CHECK LIST FOR COMPLETE NEUROLOGICAL EXAMINATION

Patient's Name:_____ Age:_____ Sex:_____ Marital:_____
Main Complaint and History:_____

History or Introduction Card Comments:_____

Coding: Checked ✓, + Positive X - abnormal 0 - normal - Negative ? questionable

I CEREBRAL FUNCTION, GENERAL

1. General Behavior:
   a) Clothing:_____ c) Mannerisms:_____ e) Cooperation:_____
   b) Cleanliness:_____ d) Eccentricities:_____ f) Other:_____

2. Consciousness:
   a) Alertness:_____ c) Attentiveness (ideas, suggestions):_____
   b) Orientation (at ease):_____ d) Macewen's Sign:_____

3. Intellectual Performance:
   a) Retention of digits & digital series: (537291) good fair poor
   b) Repetition of digital series backwards: (692847) good fair poor
   c) Addition:_____ Multiplication:_____ Division:_____ Other:_____
   d) Counting backwards by "3"s: (to 60) Time:_____ No. of errors:_____
      By "7"s: (to 60) Time:_____ No. of errors:_____ Other:_____
   e) Abstract Reasoning: (Slogans or proverbs explanation)
      A stitch in time saves nine: Satisfactory:_____ Non-satisfactory:_____
      The squeaky wheel gets the grease: Satisfactory:_____ Non-satisfactory:_____

4. Emotional Status: (Present:+ or Absent:-)
   a) Tension:_____ c) Depression:_____ e) Other:(explain below)_____
   b) Hostility:_____ d) Euphoria:_____

5. Thought Content:
   a) Undue Preoccupations:_____ d) Illusions:_____
   b) Inappropriate thoughts & ideas:_____ e) Fantasies:_____
   c) Excessive repetition:_____ f) Hallucinations:_____
   g) Disturbances:_____
   If positive or abnormal,
   Explain:_____

II SPECIFIC CEREBRAL FUNCTIONS:

1. Cortical Sensory Interpretations: (AGNOSIA) (see body parts)
   a) Visual: compass:____ sliderule:____ protractor:____
   b) Auditory: tuning fork:____ clinking coins:____ door handle:____
   c) Tactile: coin denominations:____ button:____ belt buckle:____

2. Cortical Motor Integration: (APRAXIA)
   a) Motor strength: Upper Limbs (optimum position) Rt.:____ Lt.:____
      Lower Limbs (optimum position) Rt.:____ Lt.:____
      Specific Joints: joint:_____ muscle grade:_____
      joint:_____ muscle grade:_____
   b) Close safety pin, Rt.:____ Lt.:____ Screwdriver use:_____ Drawing:_____

3. Language Functions: (APHASIA)
   a) Auditory-verbal:_____ (hear & explain meaning of a phrase)
   b) Expressive writing: eyes open:_____ eyes closed:_____ (single words)
   c) Visual-verbal:_____ (read & explain a simple phrase)
   d) Body parts (gestures) Rt. Upper:_____ Rt. Lower:_____
      Lt. Lower:_____ Lt. Lower:_____

III COORDINATION DISTURBANCE: (Cerebellum vs Posterior Columns)

1. Pass Pointing (+ or -)

	Tremor	Type	Ataxia	Dysmetria
Right finger to nose, eyes open:	+ -	+ -	+ -	+ -
Right finger to nose, eyes shut:	+ -	+ -	+ -	+ -
Left finger to nose, eyes open:	+ -	+ -	+ -	+ -
Left finger to nose, eyes shut:	+ -	+ -	+ -	+ -
Right finger to nose to finger:	+ -	+ -	+ -	+ -
Left finger to nose to finger:	+ -	+ -	+ -	+ -

2. Adiadokokinesia - Upper Trunk (Check ; ✓)
   a) Supination-pronation: right, reg.____ irreg.____ left, reg.____ irreg.____
   b) Finger to thumb: right, reg.____ irreg.____ left, reg.____ irreg.____

3. Balance & Coordination - Lower trunk: Tremor Type Ataxia Dysmetria
a) Heel to shin - right side: + - + - + - + -
b) Heel to shin - left side: + - + - + - + -
c) Toe to finger - right side: + - + - + - + -
d) Toe to finger - left side: + - + - + - + -

4. Station and Gait: Stance Tremor Ataxia
a) Eyes open (biped): X O + - + -
b) On one foot: X O + - + -
a) Eyes closed (biped): X O + - + -
b) One one foot: X O + - + -
a) Ambulation: ataxic + - Tandom gait, eyes open: X O eyes closed: X O

5. Speech: Slowness + - Dragging + - Irreg. + - Scanning + - Thick + -

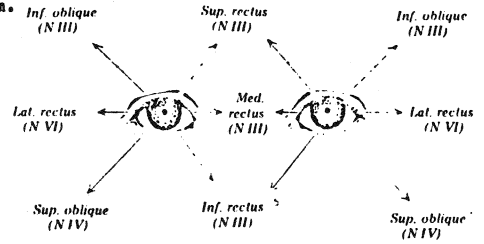
6. Asthenia: Biceps Pull, rt. + - lt. + - Arm put down, rt. + - lt. + -

7. Sensory Deficit:
a) Vibration Sensitivity: (Present : P Absent : A)
Rt. Side: wrist: P A elbow: P A shoulder: P A
hip: P A knee: P A shin: P A ankle: P A
Lt. Side: wrist: P A elbow: P A shoulder: P A
hip: P A knee: P A shin: P A ankle: P A
b) Deep Pressure Pain: (Muscle group sensitivity to pain)
Rt. Side: Forearm: P A Arm: P A Thigh: P A Calf: P A Achilles: P A
Lt. Side: Forearm: P A Arm: P A Thigh: P A Calf: P A Achilles: P A
c) Motion & Position: (X - Abnormal O - Normal)
Rt. Hand: Thumb: X O Index: X O Middle: X O Ring: X O Little: X O
Lt. Hand: Thumb: X O Index: X O Middle: X O Ring: X O Little: X O
Rt. Foot: Gr. Toe: X O 2nd: X O 3rd: X O 4th: X O 5th: X O
Lt. Foot: Gr. Toe: X O 2nd: X O 3rd: X O 4th: X O 5th: X O

CRANIAL NERVES: Scheme: Normal: (X) Abnormal: (O) right/ left

1. Olfactory: Patency of nasal passages: coffee:___/___ tobacco:___/___
2. Optic: Record patient's best vision. Note: corrected___ or Uncorrected___
Visual Acuity (Distance) Rt: 20/___ Lt: 20/___ Total: 20/___
Visual Acuity (Near) Rt: 20/___ Lr: 20/___ Total: 20/___
Peripheral Vision: Rt: Lat___/90° Med___/60° Up___/50° Down___/70°
Lt: Lat___/90° Med___/60° Up___/50° Down___/70°

GLobe Movements: X=Norm. O=Abnorm.
Note: Ophthalmoplegia



3. Oculo. Rt. Eye: up & out___
" " : up & in___
" " : medial___
" " : down & in___
Lt. Eye: up & out___
" " : up & in___
" " : medial___
" " : down & in___
4. Troch. Rt. Eye: down & out___
Lt. Eye: " " ___
6. Abduc. Rt. Eye: Lateral ___
Lt. Eye: " " ___
Pupil size (in mm.) ___/___ Pupillary reflex:___/___ Distance:___/___

5. Trigeminal: Mark + for present and - for absent
a) Pain Forehead___/___ Cheek___/___ Chin___/___
b) Light touch " ___/___ " ___/___ " ___/___
c) Heat " ___/___ " ___/___ " ___/___
d) Cold " ___/___ " ___/___ " ___/___
Corneal Reflex: ___/___ Jaw Jerk:___/___ Open mouth resistance:___/___
Motor: Open mouth lateral deviation___/___ Lateral Strength___/___
Strength of bite___/___ Size (Masseter & Temporal Myos.)___/___

7. Facial: Eyebrow strength: strong___/___ weak___/___ Mark + or - for:
Asymmetry re: forehead___/___,eyebrow lift___/___,show teeth___/___
Sensory (taste): sugar___/___ salt___/___ vinegar___/___

8. Acoustic: Cochlear Division (Hearing) Wrist-watch test: rt___/20 lt___/20
Rinnes test: Rt. Ear: Total time (seconds)___ Bone:___ Air:___
Lt. Ear: " " ___ " ___
Weber's test: Equal___ Heard more on Rt.___ on Lt.___ (check one)
Vestibular Division: Check + or - (positive/negative)
Nystagmus:
Horizontal: Med___/___ Lat___/___ Vertical: Up___/___ Down___/___
Pass Pointing: Vertical___/___ Horizontal___/___ (mark norm or abnorm)
Romberg test: pos___ neg___

9. Glossopharangeal: (Mark A for abnormal, N for normal, ? for questionable)
and
10. Vagus: Gag reflex (Pharynx): rt:___ lt:___ Phonation: rt:___ lt:___
Palatal reflex (uvula): rt:___ lt:___ Vowels:___
Hoarseness:___ Swallowing:___ Aphonia:___

11. Spinal Accessory: Shoulder Shrug: High: rt:___ lt:___ Low: rt:___ lt:___
Strength: (see tests for Sternocleidomastoideus)
12. Hypoglossal: Tongue deviation: outside mouth: rt:___ lt:___
inside mouth: rt:___ lt:___
Lateral strength: rt:___ lt:___ in cheek: rt:___ lt:___ (norm-abnorm)

IV THE MOTOR SYSTEM

1. Muscle Size:
a) Shoulder girdle: Symmetry: rt.___ lt. ___ Palpation: rt. ___ lt. ___
b) Arm: Size at rest: right ___ left ___ Size contracted: right ___ left ___
c) Forearm size at rest: right ___ left ___ Size contracted: right ___ left ___
d) Hand size at rest: right ___ left ___ Size contracted: right ___ left ___
e) Neck & spinal muscles: Symmetry: rt. ___ left ___ Palpation: rt. ___ left ___
f) Thigh size at rest: right ___ left ___ Size contracted: right ___ left ___
g) Calf size at rest: right ___ left ___ Size contracted: right ___ left ___
h) Foot size at rest: right ___ left ___ Size contracted: right ___ left ___
i) Symmetry of posture ___ muscle contours ___ outlines ___
2. Muscle Tone: (note positive for right or left)
a) Brachium: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
b) Forearm: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
c) Hand: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
d) Thigh: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
e) Calf: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
f) Foot: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
g) Neck & Spine: Atrophy ___ Percussion: myotonia ___ irritability ___ fasciculations ___
3. Passive Movement: (note right or left and positive)
a) Fingers: rigidity ___ flaccidity ___ fasciculations ___
b) Wrist: rigidity ___ flaccidity ___ fasciculations ___
c) Elbow: rigidity ___ flaccidity ___ fasciculations ___
d) Shoulder: rigidity ___ flaccidity ___ fasciculations ___
e) Toes: rigidity ___ flaccidity ___ fasciculations ___
f) Ankle: rigidity ___ flaccidity ___ fasciculations ___
g) Knee: rigidity ___ flaccidity ___ fasciculations ___
h) Hip: rigidity ___ flaccidity ___ fasciculations ___
i) Neck & Spine: rigidity ___ flaccidity ___ fasciculations ___
4. Involuntary Movements: (Active motion - note right or left & positive)
a) Fingers: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
b) Wrist: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
c) Elbow: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
d) Shoulder: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
e) Neck & Spine: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
f) Hip: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
g) Knee: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
h) Ankle: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
i) Toes: irregular___ jerky___ choreiform___ tics___ dystonic-myoclonic___
5. Muscle Strength: (note muscle grade and approximate value)
a) Neck: Flexion___ Extension___ Lat. flexion rt.___ Lat. flexion lt.___
right rotation___ left rotation___
b) Dorso-lumbar Spine: Flexion___ Extension___ Lat. flexion rt.___ Lat. flexion lt.___
right rotation___ left rotation___
c) Shoulder: Forward flexion: rt. ___ lt. ___ Backward extension: rt.___ lt.___
Abduction: rt.___ lt.___ Adduction: rt.___ lt.777
External rotation: rt.___ lt.___ Internal rotation: rt.___ lt.___
d) Elbow: Flexion: rt.___ lt.___ Extension: rt.___ lt.___ Pronation: rt.___ lt.___
Supination: rt.___ lt.___
e) Wrist: Dorisflexion: rt.___ lt.___ Palmar-flexion: rt.___ lt.___
Ulnar deviation: rt.___ lt.___ Radial deviation: rt.___ lt.___

f) Thumb, flexion: I.P.: rt._____ lt._____ M.P.: rt._____ lt._____ C.M.: rt._____ lt._____
extension: I.P.: rt. _____ lt._____ M.P.: rt._____ lt._____ C.M.: rt._____ lt._____
g) Index, flexion: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
extension: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
h) Middle, flexion: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
extension: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.X.P.: rt._____ lt._____
i) Ring, flexion: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
extension: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
j) Little, flexion: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____
extension: D.I.P.: rt._____ lt._____ P.I.P.: rt._____ lt._____ M.C.P.: rt._____ lt._____

IV THE MOTOR SYSTEM

5. Muscle Strength: (continued) Lower Trunk
a) Hip: Flexion: rt._____ lt._____ Abduction: rt._____ lt._____ Adduction: rt._____ lt._____
Extension: rt._____ lt._____ Right Rot.: rt._____ lt._____ Left Rot.: rt._____ lt._____
b) Knee: Flexion: rt._____ lt._____ Extension: rt._____ lt._____
c) Ankle: Plantar flexion: rt._____ lt._____ Dorsiflexion: rt._____ lt._____
Inversion: rt._____ lt._____ Eversion: rt._____ lt._____
d) Great Toe: Plantar flexion: rt._____ lt._____ Dorsiflexion: rt._____ lt._____

V THE SENSORY SYSTEM (note dermatomal or peripheral nerve distribution)

1. Superficial Tactile Sensation:
a) Right side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____
b) Left side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____
c) Perineal: rt._____ lt._____ Perianal: rt._____ lt._____

2. Superficial Pain:
a) Right side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____
b) Left Side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____

3. Temperature Sensitivity:
a) Right Side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____
b) Left Side: Hand: ant._____ post._____ medial_____ lateral_____
Forearm: ant._____ post._____ medial_____ lateral_____
Arm: ant._____ post._____ medial_____ lateral_____
Trunk: ant._____ post._____ medial_____ lateral_____
Thigh: ant._____ post._____ medial_____ lateral_____
Leg: ant._____ post._____ medial_____ lateral_____
Foot: ant._____ post._____ medial_____ lateral_____

7. Two Point Discrimination: (note corresponding areas, side for side and give patient differentiation distance)
a) Right upper limb: _____ Left upper limb:_____
b) Right upper limb: _____ Left lower limb:_____

8. Point Localization: Right upper limb:_____ Left upper limb:_____
Right lower limb:_____ Left lower limb:_____

9. Texture Discrimination: Right hand: Cotton_____ Steel Wool_____ Silk_____
Left hand: Cotton_____ Steel Wool_____ Silk_____

10. Graphesthesia: Right hand: ant._____ post._____ Left hand: ant._____ post._____
Back: ant._____ post._____ Other:_____
Right foot: ant._____ post._____ Left foot: ant._____ post._____

Check off list for reflex status

Scheme(rt)/(lt)

Deep Tendon Reflexes of the Upper Extremity:

Jaw (C-V, pons)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Pectoral (C-5/T-1)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Scapulo-humeral (C-5/C-6)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Biceps (C-5/C-6)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Triceps (C-7/C-8)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Radial (C-5/C-6)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Ulnar (C-8/T-1)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Wrist (C-7/C-8)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___

Deep Tendon Reflexes of the Lower Extremity:

Suprapatellar Normal___/___	Clonus, sustained___/___		Intermittent___/___	
Patellar (L-2/L-4)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Hamstring (L-4/S-2)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___
Achilles (S-1/S-2)	Equal_____	Absent___/___	Hypo___/___	Hyper___/___

Superficial (Skin and Mucous Membrane) Reflexes:

Upper abdominal (T-7/T-9)	Present___/___	Absent___/___
Lower abdominal (T-10/T-12)	Present___/___	Absent___/___
Corneal (C-V, C-VII)	Present___/___	Absent___/___
Palatal (C-V, C-X)	Present___/___	Absent___/___
Gag or pharyngeal (C-IX, C-X)	Present___/___	Absent___/___
Cremasteric (L-1/L-2)	Present___/___	Absent___/___
Gluteal (L-4/L-5)	Present___/___	Absent___/___
Plantar (L-4/S-2)	Present___/___	Absent___/___
Superficial anal (S-4/S-5)	Present___/___	Absent___/___

Pathological Reflexes of the Upper Extremity:

Hoffmann	Present___/___	Absent___/___
Tromner	Present___/___	Absent___/___
Klippel-Weil	Present___/___	Absent___/___

Pathological Reflexes of the Lower Extremity:

Babinski	Present___/___	Absent___/___
*Rossolimo	Present___/___	Absent___/___
Chaddock	Present___/___	Absent___/___
Oppenheim	Present___/___	Absent___/___
Schaefer	Present___/___	Absent___/___
Gordon	Present___/___	Absent___/___
*Mendel-Bechterew	Present___/___	Absent___/___
Gonda	Present___/___	Absent___/___

*Plantar flexion of toes indicates positive test, unlike the others which demonstrate a Babinski sign, or at least a Babinski toe sign.

THE NEUROLOGICAL EXAMINATION OF THE NEWBORN

Things To Look For

Observation of Infant at Rest:

Note: 1. Spontaneous Movement
2. Palpebral Fissures (equality)
3. The "Setting Sun Sign"
4. Marcus Gunn Sign (Elevation of lid with jaw movements)
5. Abnormal movements: a) Writhing baby
b) Myoclonus
c) Flaccidity
d) Irregular
e) Jittery
6. Posture of the arms: (alongside the head? - mongolism - brachial palsy)
7. The Moro Reflex

Responses to Stimuli:

Note: 1. Blink reflex (reaction to light) - (the Dazzle Reflex
2. Reaction to sound (jerking reflex) & the Moro Sign
3. Palmar grasping (absent or present)
4. Plantar grasp (absent or present)
5. Knee jerk (note: the head should be in the midline) absent or eggagerated
6. Clonus of ankle (determine if temporary or sustained)
7. Rooting response (head follows finger - sucking reflex)
8. Fasciculating tongue

Prone Position Movements:

Greater Handling of the Infant:

Note: 1. Moving head up & down and observing the eyes (Doll's eyes)
2. Rotation of baby by doctor (looks backwards when stopping)
3. Tonic neck reflexes (turn head and hold shoulders down)
4. Traction lifting: should be resistance from shoulders
5. Baby sit-ups - Traction Response (head should support itself and it should also be symmetrical
6. Withdrawal response to pinprick
7. Spontaneous stepping movements
8. "Placing response"
9. Trunk incurvation reflex (Dorsal Reflex)
10. Moro Response (arms extend and then flex)
11. Neck, trunk & limb manipulations (passive R.O.M. _ complete or not)
12. Supine, lateral and prone suspension & the Landau Reflex
13. Contractures & strictures

Transillumination of the Head:

Note: AP. PA. and lateral views

Pupillary Reflex:

Eyes: note ophthalmoscopic examination

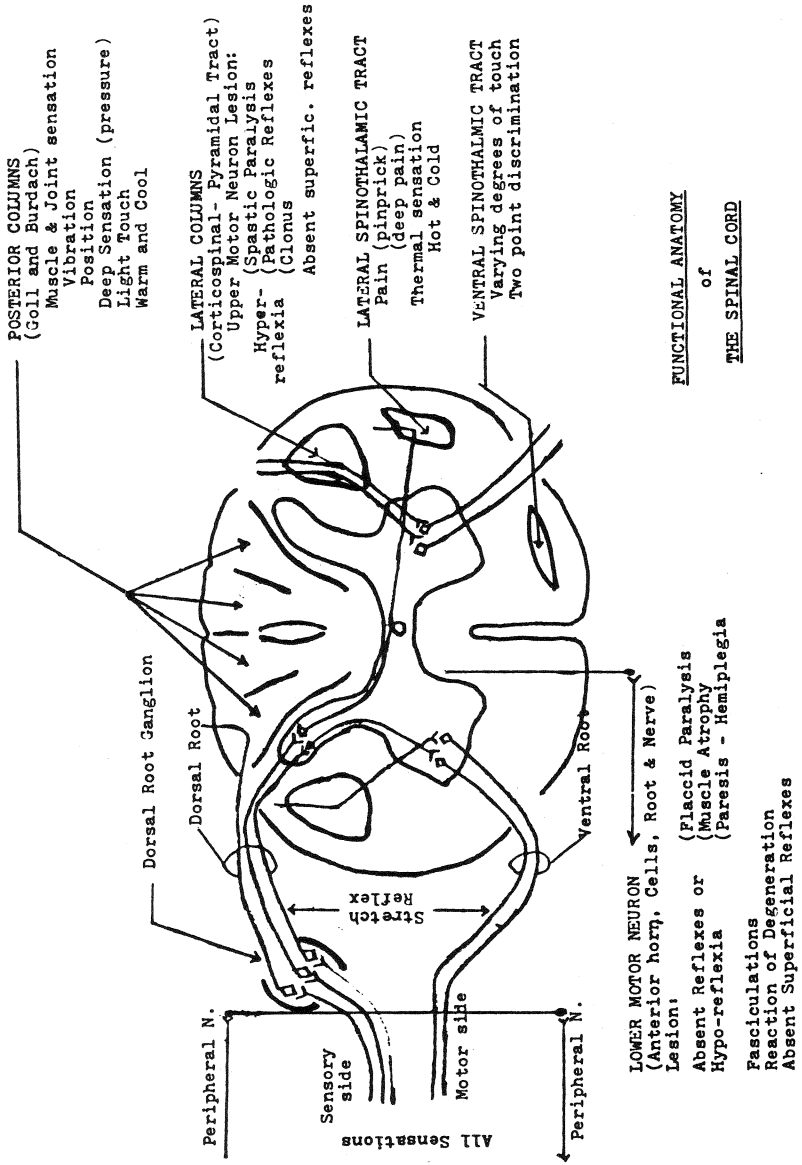
NEUROLOGICAL EXAMINATION OF THE ONE YEAR OLD, THINGS TO LOOK FOR

Note: Give that part of the exam least disturbing to child, first.

OBSERVATION of the baby:
Balance: (sit, stand by himself) _____
State of Consciousness, orientation _____
Face - Eyes - Movements (asymmetry) _____
Hand Preference: Athetoid ____ Abnormal head postures ____ Clenching fist ____
Spasticity ____ Fisting ____
Problem solving: (Infant seated on mother before a flat surface)
a) Ring & string ____
b) Stacking of cubes ____
c) Cubes in a cup ____
d) Wrapped cube ____
Visual fields: Eye movements ____ Conjugate gaze ____
Reaction to light: _____
Strabismus: (pin points of light)
Divergent _____ Convergent _____
Hearing: (turning of eyes or head toward sound) _____
Sensation to touch: Movement of part ____ turning of eyes ____ turning head ____
Sensation to pinprick: Movement away ___ turning eyes to ___ turning head toward ____
Motor function: range of motion _____
stretch reflex _____
tightness _____
Hand or foot deviation _____
Corneal reflex _____
Closure of eyelids: to stimuli ____ to light ____ other ____
Palpation of muscles _____
Tendon reflexes: Jaw ____ biceps ____ triceps ____ knee ____ ankle ____
_____ Pathologic reflexes: Babinski ____ Tromner ____

TESTS
Clonus: _____
Manner of locomotion: _____ Asymmetry _____
Posture when suspended: Vertical _____ Horizontal _____
Landau: _____
Vestibular Nystagmus: Quick opponent to direction of movement _____
Upon stopping (the reverse) _____
Placing reflex (bringing feet from table edge) _____
Supporting reaction (when feet touch, legs should extend) _____
Parachute reflex: _____
Superficial reflexes: _____
Tonic righting reflexes: _____
Tonic neck reflexes: _____

Eyes: _____ Eyegrounds _____
Throat: _____ Gag reflex _____
Tone of anal sphincter _____
Transillumination of head: Halo effect _____ Laterally _____ A & P _____



THE PROPRIOCEPTIVE SYSTEM

Functions: 1. The Production of Smooth, Coordinated Movement
2. The Maintenance of Posture

Composition: Three Great Systems:
1. The Posterior Columns (of the spinal cord)
2. The Cerebellum
3. The Vestibular Tract

Note: A disease of any of the above will cause a disturbance of: Equilibrium, Movement and/or Coordination

THE POSTERIOR COLUMNS: Transmits Deep Sensations (measured by position and vibratory sense) Light touch sensations & 2 point discrimination

Disease Symptoms: 1. Loss of muscle and position sense
2. The above symptoms increase with the loss of vision
3. Patient has an abnormal increased need for visual impulses

The outstanding symptom of Posterior Column Disease: ATAXIA (incoordination of muscle action) which is increased with the eyes closed (note Romberg Sign) or in the dark thus producing gait disturbances. Because of the need for visual impulses, those with Posterior Column Disease: a) must watch their movements closely, e.g. the legs in walking and the arms in reaching, thus their gait is wide-based and unsteady b) precision movements, e.g. finger to nose, heel to knee, produce a shooting beyond the mark(DSIMETRIA) or failure to reach the mark, c) muscle efforts produce a coarse tremor and dysmetria.

The above ataxia is dependent on sensory loss (loss of position & muscle sense, in the darkness there is an inability to gauge position in space and distance. Note: Posterior Column Ataxia does not occur without sensory loss (vibration, position deep sensation, light touch, etc). Not so clinically important is Astereognosis and two point discrimination. Clinical Entities: Tabes, Multiple Sclerosis, Spinal Cord Tumor, Syringomyelia.

THE CEREBELLAR SYSTEM: Receives AFFERENT impulses and transmits them to EFFERENT pathways - disease symptoms are ipsilateral
Primary Symptom: Asynergia (or Dyssynergia) - a jerky decomposed movement which is highly incoordinate & has no relation to vision, also this asynergia is not related to or associated with sensory deficit.

In reaching for the goal: is done with intense incoordination using accessory muscles, there is a wide arc of motion & much purposeless movement but the patient does reach the goal, e.g. in the finger to nose test there is a wide arc of motion, coarse tremor, much jerking but the effort does make it successfully.

Cerebellar Gait: wide base - trunk & head held stiffly - legs shoot out from the hips - arms flung about without relation to leg movements - much lurching & reeling as if drunkenly staggering.
In the arms: the affected limb drops somewhat - drifts outward on extension - irregularity of movement on patting tests - irregularity on alternating pronation and supination tests.

Other Symptoms: 1. Intention tremor - increases in degree as the limb approaches the goal, is best seen in the upper limbs 2. Speech - scanning type, shows DYSARTHRIA (indistinct innunciation) is at first slow and hesitant, then running together & garbled 3. Tonus Disturbances - delay in starting & stopping muscle movement, e.g. in pull & release the patient strikes himself 4. Hypotonia of muscle 5. Hypermobility of joints.

THE VESTIBULAR SYSTEM: Responsible for transmitting impulses of coordination to the ocular connections.

Etiology of disturbances: Lesions of the labyrinths, vestibular nerve, brain stem, cerebrum and cerebellum.

The outstanding subjective symptom: Vertigo (true) which requires the sensation of motion.

True vertigo may be:
a) Objective: a sensation that the surroundings are revolving around the patient who remains stationary.
b) Subjective: the patient is revolving around stationary surroundings.

The outstanding objective sign: Nystagmus (true), a horizontal, vertical or rotary oscillation of the eyeballs.
True nystagmus must have both a fast and a slow component and must be sustained.

Such nystagmus may be elicited by having the patient look to the right or to the left and hold the gaze, the resulting action being characterized by a fast movement to the deviated side and a slow movement to the neutral side.
Nystagmus is referred to as right or left, superior or inferior, relative to the side of the fast component.

REFLEX STATUS

Reflexes constitute some of the most important findings in a neurological examination. The majority of times, improper procedure, interpretation and significance is given to these extremely helpful responses. When properly performed, however, an examination of reflex status will give such valid information as will be found in the neurological realm.

Reflexes are classified into three major categories:
I. The Deep II. The Superficial III. The Pathological

I. The deep reflexes, also called tendon reflexes (or redundantly, the deep tendon reflexes) are the responses of a muscle or a group of muscles to being quickly and controllably stretched, hence another term, the stretch or myotatic reflex is currently being used. An understanding of the mechanism of this reflex is essential for the examiner to intelligently interpret the significance of any pathological responses.

The deep reflex is dependent upon five anatomical divisions: One, a receptor in the form of a peripheral sensory nerve ending located in the muscle or group tendon, sometimes given the name of the Golgi Tendon Organ. When the tendon is stimulated by a quick and properly given stretch, e.g. a stroke with a percussion hammer, it will discharge an impulse along: Two, an afferent (sensory) conductor. It is important to note that the stretch must be rapid and well applied, a slow or gradual stretch will not give proper stimulation. The impulse will be transmitted along the afferent conductor into and thru the sensory nerve root to the spinal cord where it will enter: Three, a synaptic center which will convey the impulse over to: Four, an efferent (motor) conductor to be distributed to: Five, the efferent mechanism of muscle fibers. An interuption anywhere between the muscle and its receptor will give rise to the pathology of a Lower Motor Neuron Lesion. An interuption anywhere along the Pyramidal (Corticospinal) tracts which bring motor impulses from the cortex to the anterior horn cells of the spinal cord will give rise to the pathology of an Upper Motor Neuron Lesion. Therefore, the primary goal in the evaluation of deep reflexes is to determine if there is an Upper or Lower Motor Neuron Lesion.

When the criteria for properly taking deep reflexes is met, the reflex is almost totally involuntary, making it of special value as it cannot be faked by the patient and stands alongside other findings which cannot be simulated, e.g. unequal pupil size, unequal upper limb blood pressure, etc.

With every single stimulus (percussion hammer stroke) there should be one motor response, namely brief muscle contraction. When a single stimulus to tendon or skin elicits more than one or multiple responses, a condition of Clonus is evidenced; one of the criteria for an Upper Motor Neuron Lesion.

Deep reflexes can be graded as 1. Equal, Absent, Hypoactive or Hyperactive or by 2. The Wexler Scale, which is as follows:

0	Absent with reinforcement
1 (+1) (1+) (+)	Hypoactive
2 (+2) (2+) (++)	Normal (sluggish or brisk)
3 (+3) (3+) (+++)	Hyperactive
4 (+4) (4+) (++++)	Hyperactive with transient clonus
5 (+5) (5+) (+++++)	Hyperactive with sustained clonus

This author prefers the former method of grading by which one side is compared with the other giving a better anatomical reference. The determination in this respect is to elicit that of equality, which when presented indicates either a bilateral neurological pathology (a very remote possibility) or normalcy (the most probable and likely conclusion).

When inequality is encountered, however, the reflexes give their most valuable information. In this respect obviously one is hyperactive and one is hypoactive to the other. The examiner in order to differentiate an Upper Motor Neuron Lesion from a Lower Motor Neuron Lesion should check out the hyperactive side first for, in addition to the hyper-reflexia, a) the presence of pathological reflexes, b) clonus and c) spastic paralysis to determine an Upper Motor Neuron Lesion. If the hyper-reflexia is not accompanied by a), b) or c) an Upper Motor Neuron Lesion is rules out. The physician should then turn to the hypoactive side to determine a Lower Motor Neuron Lesion and check for a) flaccid paralysis, b) muscle atrophy, c) fasciculations and d) reaction of degeneration. If the hypo-reflexia is not accompanied by a), b), c) or d), a Lower Motor Neuron Lesion is ruled out.

The observance of the following criteria for the taking of deep reflexes is directly proportional to the accuracy of the response information.

1. Optimum Position Of The Patient
   The patient should be in that position: a) requiring a minimum of effort (so as to prevent untoward reinforcement) b) allowing the examiner free access to elicit the reflex and c) maintaining as complete symmetry as possible.
2. Optimum Position Of The examiner
   The doctor should be in a position where he can get about the patient and can easily compare the response of both sides with a minimum of movement and effort and thereby monitor the reflexes both palpably and visually when necessary. Some reflexes are poorly elicited visually, e.g. the jaw and pectoral reflexes, making palpation the dominent factor in determining equality. Thus asymmetry, patient posture, increased effort to maintain balance all contribute to the inaccuracy of responses.
3. Basal Position Of The Musculature Being Tested
   The area being tested should be in as basal a position as possible with no undue effort relative to positioning or posture on the part of the patient. Many times the patient will seek to "assist" the doctor by holding a position or maintaining a posture through muscle contraction or by placing the area into undue tension. If this happens the physician is then relying more on the patient equally contracting or tensing the musculature than on his own procedures.
4. Stroke for Rebound
   The reflex hammer stroke should always be followed by a rebound, this insures that it is truly a stroke and not a touch or a push. WRist movement with the percussion hammer being held somewhat lightly between the thumb and index finger performing a well regulated, easily duplicated blow allows for equal distribution over the areas being tested. The palpation and percussing hands of the physician should change as little as possible if at all, to better develope stroke and feeling.
5. Comparison of the Symmetrical Counterpart
   The examiner searches for that point of maximum response on the affected side first (if unilateral) and then compares the response on the symmetrical counterpart with the patient not changing position and the doctor duplicating his procedure as identically as possible.

II. Superficial Reflexes:

Are called "brain" reflexes as they have their synaptic center in the cerebrum. They require cutaneous (skin or mucous membrane) stimulation. As they depend on the anatomy of the upper and lower motor neuron arcs they are absent with a lesion of either one.

III. Pathological Reflexes:

These reflexes constitute certain clinical manifestations to stimuli which are not seen normally but are present in lesions of the pyramidal (corticospinal) tracts. They represent the responses of the hyper-reflexia attending an Upper Motor Neuron Lesion.

The Babinski reflex or sign is the grand-daddy of them all and is to pyramidal tract disease what the Kernig Sign is to meningitis and the Patrick Sign is to hip pathology (Refer to Babinski Reflex/Sign).

The pathological signs or reflexes are never stated as being positive or negative but as being present or absent.

Final Note: The information gained from correctly performing and interpreting reflex status is as valid as any neurological tests will reveal. All too many times, however, the examiner approaches reflex testing in a general and casual manner not perhaps realizing that the results are directly proportional to his effort. The anatomical and physiological factors governing reflex status are extremely orderly and exact and will reward the diligent practitioner in many instances far beyond his imagination.

Adrenal Disorders:
- Arroyo's S.

Abducens Nerve:
- Cantelli's S.
- Red Glass T.

Auditory Nerve Disorders:
- Auditory R.
- Bing's T.
- Cochleopapillary R.
- Gruber T.
- Rinne T.
- Weber T.

Basal Ganglia Disorders:
- Cogwheel S.
- Souques' S.

Brachial Plexus Disorders:
- Bikele's S.

Cerebellar Disorders:
- Andre-Thomas S.
- Finger to Finger T.
- Finger to Nose T.
- Finger Tapping T.
- Heel-Knee T.
- Heel-Toe T.
- Holmes S.
- Patting T.
- Pronation-Supination T.
- Rebound and Checking T.
- Toe-Finger T.

Cerebral Disorders:
- Barany Pointing T.
- Glabella R.
- Grasp R.
- Kleist's S.
- Saenger's S
- Macewen's S.

Cervical Segmental Levels:
- Biceps R.
- Brachioradialis R.
- Bradburne's S.
- Infraspinatus R.
- Inverted Radial R.
- Pectoral R.
- Radial R.
- Scapulohumeral R.
- Triceps R.
- Wrist R.

Chronic Alcoholism:
- Quinquad's S.

Clonus:
- Suprapatellar R.
- Trepidation S.

Corticospinal Tract Disorders:
- (See Pathologic Reflexes)

Dementia:
- Baillarger's S.
- Berger's T.
- Glabella R.

Dorsal Segmental Levels:
- Abdominal R.
- Barkman R.
- Beevor's S.
- Obliquus R.

Extrapyramidal System Disorders:
- Cogwheel S.
- Souques' S.

Facial Nerve:
- Consensual R.
- Corneal R.
- Orbicularis Oculi R.
- Rooting R.

Femoral Nerve:
- Cremasteric R.
- Femoral Nerve Stretch T.
- Quadriceps R.

Glossopharangeal Nerve:
- Carotid Sinus R.
- Gag R.
- Palatal R.

Graves' Disease:
- Ballet's S.
- Dalrymple's S.
- Kocher's S.

Hemiplegia:
- Bekhterev's T.
- Limb Dropping T(s).
- Platysma S.
- Pronation S.
- Strumpell's Pronation S.

Hysteria:
- (See Simulated Complaints)

Ilioinguinal Nerve:
- Obliquus R.

Intervertebral Disk Syndrome:
- Dejerine's S.
- Lindner's S.
- Naffziger's T.
- Sponge T.

Intracranial Pressure:
- Setting Sun S.

Lower Motor Neuron Lesion:
- Dorsal R.
- Limb Dropping T(s).

Lumbar Segmental Levels:
- Adductor R.
- Cremasteric R.
- Duchenne's S.
- Femoral Nerve Stretch T.
- Geigel R.
- Gluteal R.
- Hamstring R.
- Heel-Walk T.
- O'Connell's T.
- Quadriceps R.

Malingering:
- (See Simulated Complaints)

Median Nerve:
- Ochsner's T.
- Phalen S.
- Wartenberg's Oriental Prayer S.

Meningitis:
- Brudzinski S.
- Bikele's S.
- Guilland's S.
- Kernig S.

Multiple Sclerosis:
- Disconjugate Gaze S.
- Lhermitte's S.
- (See Posterior Column and Cerebellar Disorders)

Muscular Dystrophy:
- Gower's M.

Musculocutaneous Nerve:
- Biceps R.

Oculomotor Nerve:
- Accommodation R.
- Argyll Robertson S.
- Cantelli's S.
- Pupillary R.
- Red Glass T.

Obturator Nerve:
- Adductor R.

Optic Nerve:
- Dazzle R.
- Gunn Pupillary S.
- Pupillary R.

Pain Threshold:
- Libman T.

Paralysis Agitans:
- Cogwheel S.
- Glabella R.
- Souques' S.

Pathologic Reflexes:
- Head: Glabella R.
  - Head Retraction R.
  - Jaw Jerk S.
  - Platysma S.
  - Snout R.
  - Zygomatic R.
- Upper Limbs:
  - Bekhterev S.
  - Finger Thumb R.
  - Hoffmann's R.
  - Kleist's S.
  - Klippel-Weil S.
  - Palm to Chin R.
  - Trömner's S.
- Lower Limbs:
  - Babinski R.
  - Barre's Pyramidal S.
  - Chaddock's S.
  - Crossed Extension R.
  - Gonda R.
  - Gordon's R.
  - Heel-Tap R.
  - Mendel-Bechterew S.
  - Oppenheim S.
  - Piotrowski's S.
  - Schaefer's R.
  - Stransky R.
  - Strumpell's Tibialis Anterior S.

Peroneal Nerve:
- Duchenne's S.
- Lust's S.

Posterior Column Disorders:
- Abadie's S.
- Biernacki's S.
- Finger to Finger T.
- Finger to Nose T.
- Heel-Knee T.
- Heel-Toe T.
- Lhermitte's S.
- Pitres' S.
- Romberg S.
- Toe-Finger T.

Radial Nerve:
- Bikele's S.
- Brachioradialis R.
- Radial R.
- Triceps R.

Sacral Segmental Levels:
- Achilles R.
- Anal R.
- Duchenne's S.
- Hamstring R.
- Plantar R.
- Toe Walk T.

Sciatic Nerve:
- Bragard's S.
- Deyerle's S.
- Fajersztajn T.
- Lasegue S.
- Lasegue Differential S.
- Neri S.
- Sicard's S.
- Minor's S.

Simulated Complaints:
- Auditory R.
- Ballet's S.
- Block-Steiger T.
- Burn's Bench T.
- Hoover's S.
- Limb Dropping T(s).
- Mannkopf's S.
- Magnuson's T.
- Seeligmuller S.

Spinal Cord Disorders:
- Bradburne's S.
- See Posterior Column Disorders
- See Pathologic Reflexes

Suprascapular Nerve:
- Infraspinatus R.

CORRELATION of REFLEXES, SIGNS and TESTS continued:

Sympathetic Nervous System:
- Accommodation R.
- Ciliospinal R.
- Ruggeri's R.

Tabes:
- Abadie's S.
- Argyll Robertson S.
- Baillarger S.
- Bekhterev Pupillary S.
- Berger's S.
- Biernacki's S.
- Pitres' S.
- Westphal's S.

Tetany:
- Chvostek's S.
- Erb's S.
- Lust's S.
- Trousseau's S.

Tibial Nerve:
- Achilles R.
- Plantar R.
- Toe Walk T.

Trigeminal Nerve:
- Consensual R.
- Corneal R.
- Jaw R.
- Orbicularis Oculi R.
- Oculocardiac R.
- Rooting R.
- Zygomatic R.

Trochlear Nerve:
- Cantelli's S.
- Red Glass T.

Tuberculosis:
- Gauvain's S.

Ulnar Nerve:
- Froment's S.
- Ulnar R.
- Wartenberg's S.

Vagus Nerve:
- Carotid Sinus R.
- Erben's R.
- Gag R.
- Oculocardiac R.
- Somagyi's R.

Vestibular System:
- Babinski-Weil T.
- Barany T.
- Cantelli's S.
- Heel-Toe T.
- Mittlemeyer T.
- Past-Pointing T(s).

Wernig-Hoffman's Disease:
- Dorsal R.

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Index

R. - Reflex S. - Sign T. - Test

PART II

ORTHOPEDIC SIGNS/TESTS/ MANEUVERS

Preface

This manual is an effort to index and catalog the many orthopedic signs and tests designated as absent or present, negative or positive respectively, on examination forms, narrative reports and in medical testimony. The vast majority of these orthopedic procedures has an eponymic reference which has given rise to some controversy over the past years. Why use an individual's name when it would be much simpler and less confusing to describe the mechanics of the action used to perform the procedure. Instead of using the eponym, "Lasegue," why not the term "straight leg raising test;" instead of "Soto-Hall," how about "the neck flexion test?" Indeed, many authors do designate the Lasegue as the Straight Leg Raising (SLR) Test (which does not make a great case for specificity if you consider that there are more than three dozen orthopedic tests in which straight leg raising action is employed) and the Patrick Test as the Sign of Four Test and so on. When I was some seventeen years ago teaching undergraduate orthopedics, the students decried the use of eponyms and wanted the designation of a sign or test to "tell it as it is," thereby making it crystal clear what was being done relative to what the examiner was attempting to elicit. This is easier to imagine than it is to do and becomes very confusing for instance, when a single test can have many names depending upon the physician's choice of words. I have seen because of individual preference, the cervical compression test at various times listed as the neck compression, the neck (or cervical) lateral flexion, the foraminal compression, and the lateral cervical (or neck) compression tests; when one also considers abbrevations that could arise from these various terms it becomes obvious what confusion can be added. Indeed, without eponyms there is no mutual ground for any type of listing, comparsion and standardization. Eponymic references, therefore, seem the lesser of the evils and have thereby been given preference over descriptive terms.

The last word has not been stated on the multinimity of orthopedic signs and tests given in this manual. Some may not see a certain sign or test familiar to them listed herein; if such is the case, there are two main possibilities for the omission: one, that the sign or test is not within the orthopedic realm, in which case I would recommend a search for it through my first text, ***The Manual of Neurological Reflexes, Signs and Tests;*** two, that the particular sign or test is not well documented enough to achieve wide recognition. I must also point out I have used the author's prerogative to include a few tests of my own. Furthermore, there are roughly about a dozen and one half procedures contained in this work that are likewise listed in my neurological manual due to their not so clear cut orthopedic-neurological distinction.

Hopefully this manual will serve as a step in the direction of achieving some clarity and standardization of specific orthopedic procedures. Also I dearly hope it will show the practitioner some new orthopedic actions to use, for many of the signs, tests and maneuvers listed are excellent and most helpful in enabling the examiner to arrive at a diagnosis and thus initiate intelligent management.

My many thanks go again to Dr. Stanley Kaplan for his most generous contribution of time, facilities and office staff; to Drs. Paul Lombardi and Edward Goldstein; to Debbie Moore and Veronica Carr.

My appreciation for their special contributions goes to Dr. Joe B. Coffelt, Dr. James M. Cox, and Dr. Ronald C. Evans.

— J.M. Mazion

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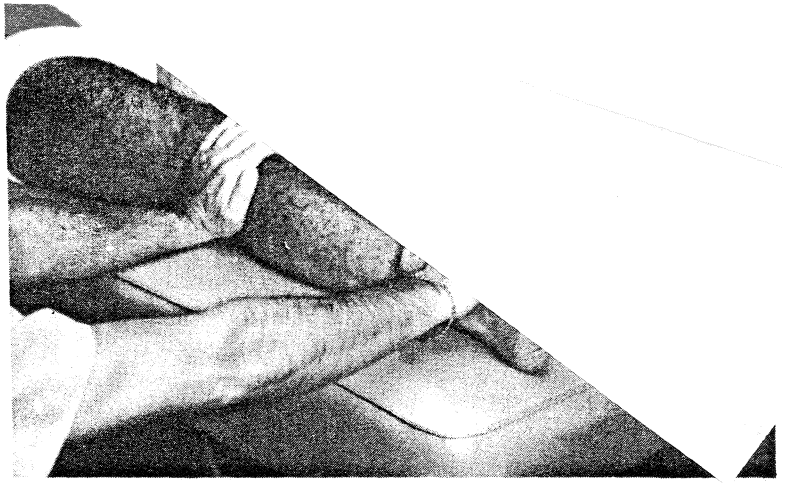


Figure 1

ABDUCTION STRESS: Test

Procedure: With the patient initially supine and the knee in complete extension, the examiner on the ipsilateral side places one palm against the lateral aspect of the patient's knee at the joint line and with the other hand gripping the ankle, the examiner draws it laterally so as to open the medial side of the joint (Fig. 1). If the patient is indifferent to this action the examiner repeats it with the knee in approximately thirty degrees of flexion which, being a position of lesser stability, makes the medial knee joint maximally vulnerable to a torsion stress.

Significance: The production or increase of pain, especially below and above the joint line, or at the joint line is evidence of medial collateral ligament injury (see also ADDUCTION STRESS Test).

Synonym: Valgus Stress Test.

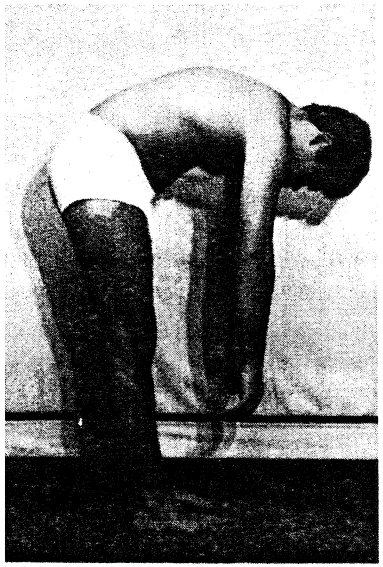
Figure 2 A

Figure 2 B

ACTUAL LEG LENGTH: Test

Procedure: The patient is standing with the feet together, bare heels on the floor, the knees and hips straight, the anterior superior iliac spines and the iliac crests exposed. The examiner by way of palpation marks the apex of the anterior iliac spines and crests of the ilia (Fig. 2a) and then measures their distance straight down to the floor (Fig. 2b).

Significance: The vertical distance of one side either above or below the other equals the difference in length of the limbs.



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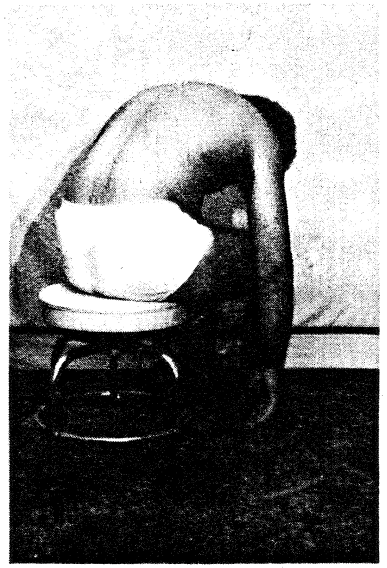

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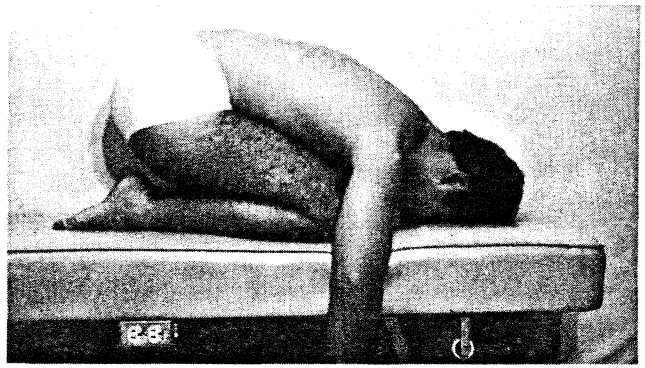

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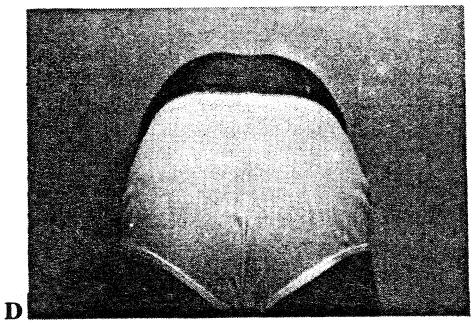

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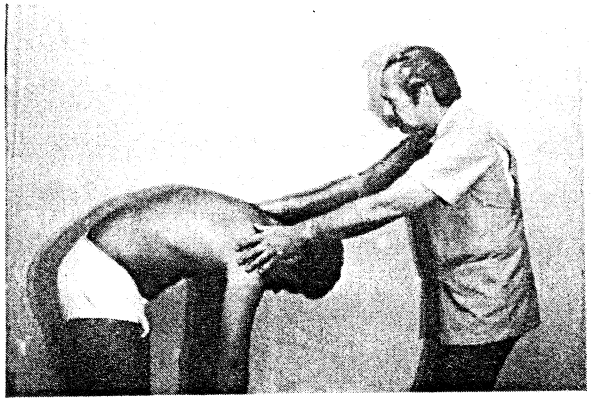


Figure 3 E

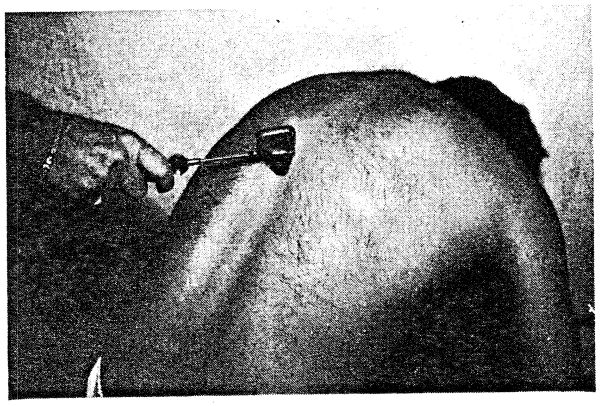


Figure 3 F

ADAM'S: Positions

1. Standing: The patient with lower limbs together and straight, bends the dorsolumbar spine into flexion of approximately ninety degrees with the head, neck and upper limbs hanging limply downward (Fig. 3a).

2. Sitting: The patient seated on a low stool or backless bench, bends the spine forward until the knees are approximated to the chest with the arms hanging limply downward lateral to the lower limbs (Fig. 3b).

3. Kneeling: The patient kneeling on a padded table or bench having a face slot, approximates the buttocks to the heels and bends acutely forward, face down in the slot, with the upper extremities hanging limply over the sides of the table (Fig. 3c).

Significance: All positions place the spine into one large "C-shaped" curvature, putting the spinous processes and paraspinal tissue into acute prominence and thus affording the examiner an ideal posture for: a) visual comparison of right and left spinal levels (Fig. 3d); b) stability and/or extent of lateral spinal curvatures (Fig. 3e); c) manual or instrumental percussion of the spine and adjacent tissues (Fig. 3f) as well as degree of dorsolumbar fixation.

Figure 4

ADAM'S: Sign

The sign is present in acute low back pain when flexion via

the standing Adam's position by the patient (Fig. 4) is that motion which is most restricted and most painful, extension may be almost as restricted and painful but never more, lateral bending is freer and rotation is the freest and least painful of all spinal motions.

Significance: The sign is characteristic of an intervertebral disk posterior or posterolateral rupture whereby forward flexion will most antagonize this type of lesion while spinal rotation places minimal stress in this particular traumatic pathology.

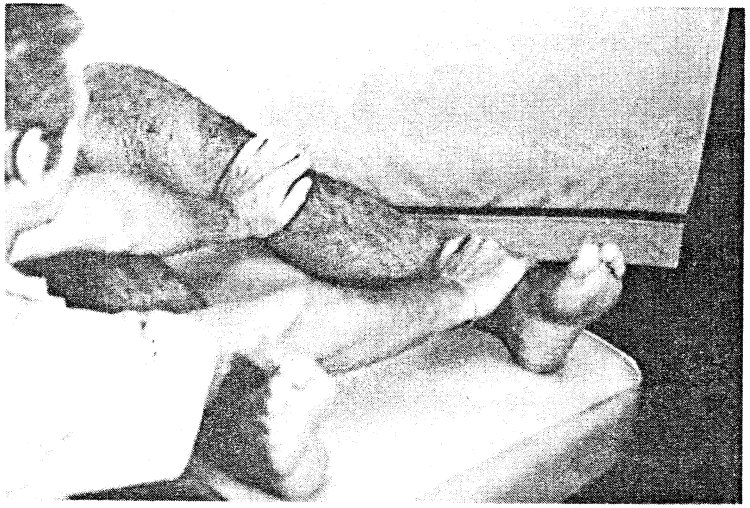


Figure 5

ADDUCTION STRESS: Test

Procedure: With the patient initially supine and the knee in complete extension, the examiner on the contralateral side places one palm against the medial aspect of the patient's knee at the joint line and with the other hand gripping the ankle, draws it medialward so as to open the lateral side of the joint (Fig. 5).

If the patient is indifferent to this procedure, the examiner repeats it with the knee in approximately thirty degrees of flexion.

Significance: An initiation or increase of pain, above and below especially, or at the joint line is evidence of lateral collateral ligament injury (see ABDUCTION STRESS test).
Synonym: Varus Stress Test.

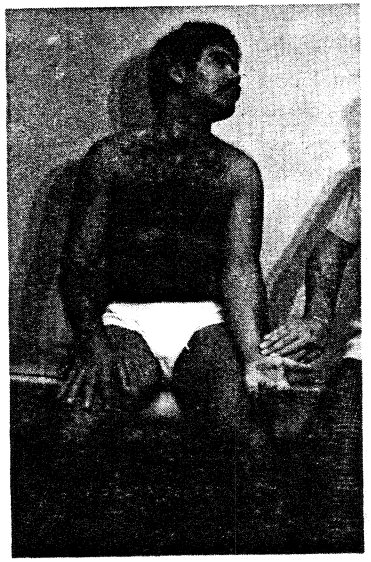


Figure 6 A

Figure 6 B

ADSON'S: Test

Procedure: With the patient sitting straight up on an examining table, the examiner palpates the radial pulse for a few seconds determining its rate, force and amplitude. The patient is then instructed to: 1) Rotate the head as far as tolerable to the side of the limb being tested; 2) Follow this by elevating the chin as high as painlessly possible and; 3) Then take a deep breath and hold it to the count of twelve (Fig. 6a). The test is positive if the radial pulse rate stops or is

dampened.

If the above maneuver is negative it should be repeated with the patient turning the head to the side opposite the limb being tested (MODIFIED ADSON'S Test - Fig. 6b).

Significance: Neurovascular compression of the subclavian artery and brachial plexus of the ipsilateral side commonly caused by the scalenus anticus and/or cervical rib thoracic outlet syndromes.

Synonym: Scalene Maneuver; Scalenus Anticus Test

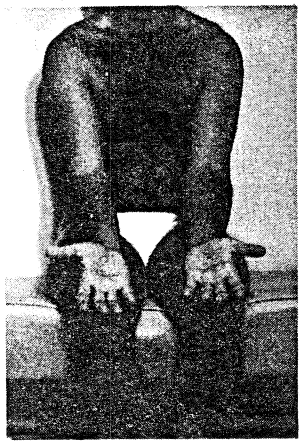


Figure 7 A

Figure 7 B

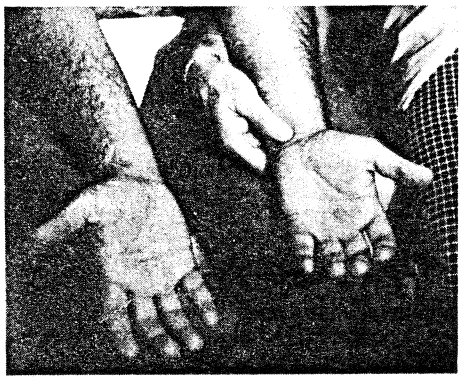
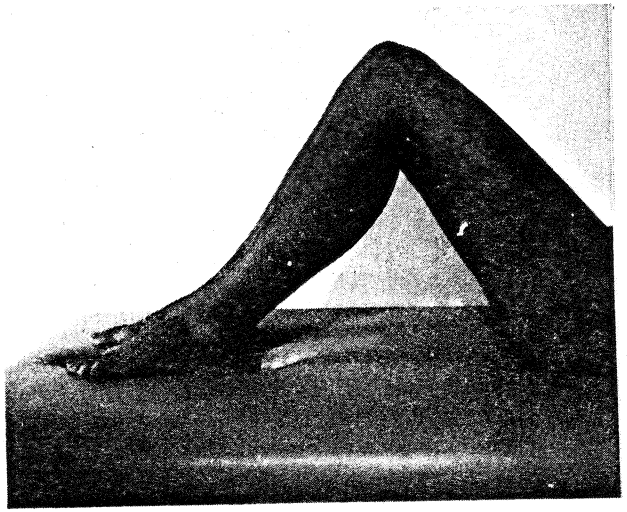


Figure 7 C

ALLEN'S: Test

Procedure: The patient is comfortably seated on an examining table with the forearms resting on the thighs and the palms up (Fig. 7a) with the following taking place: 1) The patient makes a tight fist on the side being examined; 2) The examiner digitally occludes either the radial or ulnar artery just proximal to the wrist while the patient is still clenching the hand (Fig. 7b); 3) With the examiner maintaining the occlusion, the patient opens the hand and the examiner compares color return of the hand to the contralateral side (Fig. 7c). Normally there is color return of the tested hand matching that of the opposite side in ten seconds or less.

Significance: Delayed color return during digital compression indicates partial blockage, while no color return until compression is removed indicates complete blockage of the artery which has not been compressed.



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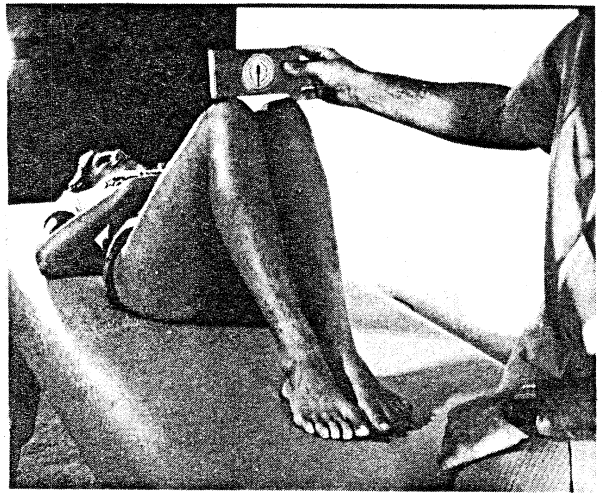

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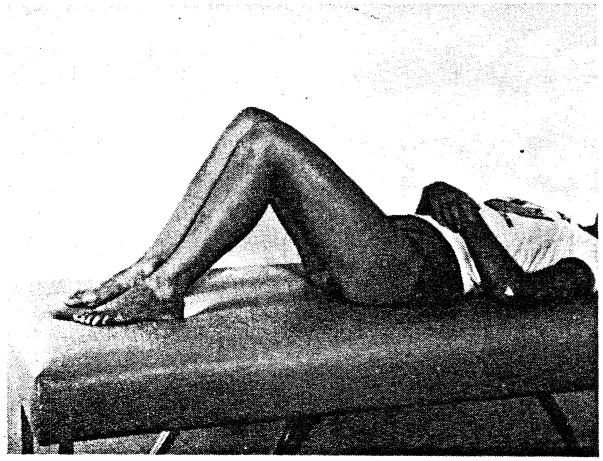


Figure 8 C

ALLIS: Test

Procedure: With the patient supine, both knees are flexed to ninety degrees, the feet are placed flat on the table, the great toes and malleoli being approximated bilaterally (Fig. 8a). The examiner then compares the levels of the knees (Fig. 8b). A significant difference reveals a positive test.

Significance: The test is positive characteristically when the femoral head is displaced posteriorly in relation to the pelvis (dislocated hip) showing the ipsilateral knee level to be inferiorly and proximally displaced (Fig. 8c). But the test can also be used to reveal any femoral shortening of the lower limb.

Synonym: Galeazzi's Sign

Figure 9

ANTERIOR FOOT DRAW: Sign

Procedure: The patient is seated on an examining table with the legs dangling and the feet in a few degrees of plantar flexion. The examiner places one hand around the anterior aspect of the lower tibia just above the ankle while gripping the calcaneus in the palm of the other hand (Fig. 9). Then while pushing the tibia posteriorly, the calcaneus (and talus) is drawn anteriorly. Normally there is no movement whatever from this action. The sign is present when the talus slides anteriorly from under cover of the ankle mortise.

Significance: Anterior talofibular ligament instability usually secondary to rupture.

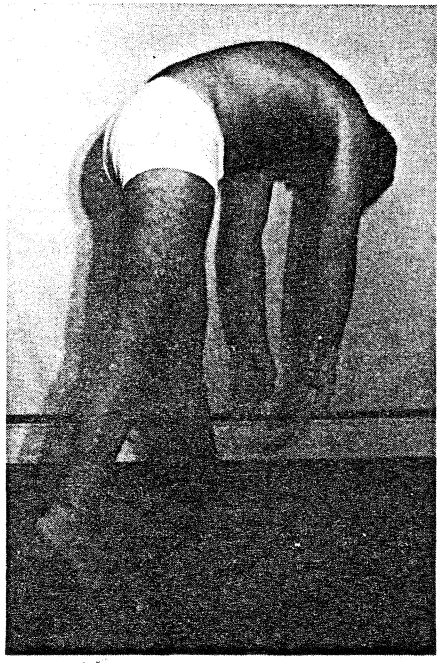


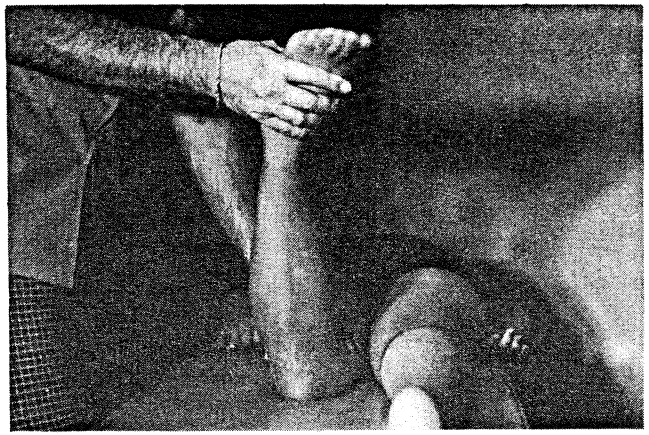
Figure 10

ANTERIOR INNOMINATE: Test

Procedure: The patient with lower trunk pain is instructed in the standing position to place the lower extremity opposite the painful side approximately two to three feet in front of the other foot as if taking a big step forward; then to bend the upper trunk acutely over the forward extremity so as to put all the weight on the front leg to the point of raising the back foot from the floor (Fig. 10). The production and/or aggravation of lower trunk pain on the posterior leg side indicates a positive test.

Significance: Unilateral forward derangement of the ilia (anterior innominate) in relation to the sacrum.

Synonym: Mazion's Pelvic Maneuver



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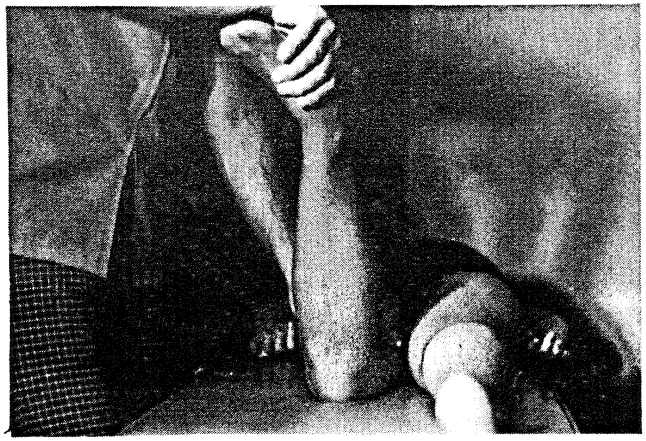

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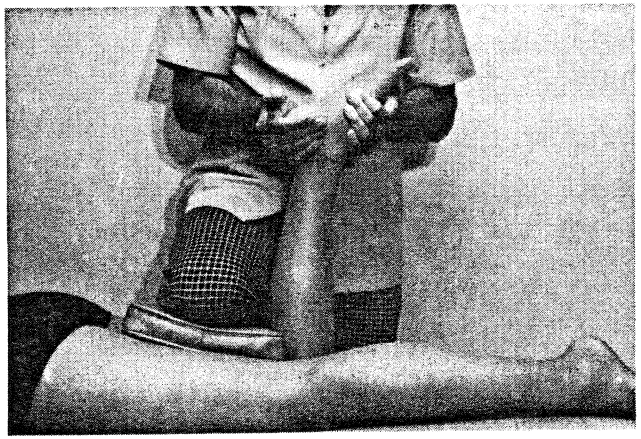


Figure 11 C

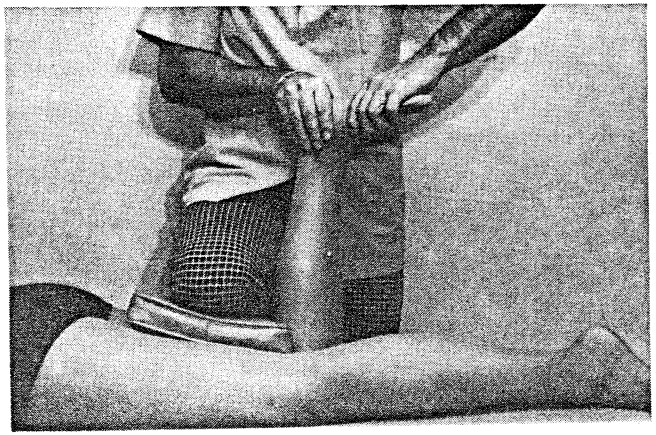


Figure 11 D

APLEY: Test

Procedure: The test involves four steps, any or all of them eliciting knee pain or clicking constitutes a positive test:
Step 1. The patient is prone with the lower limbs straight out, ankles hanging over the table edge; The examiner grasping the foot, strongly rotates the leg internally and flexes the knee past ninety degrees (Fig. 11a).
Step 2. Step 1 is repeated with the leg strongly rotated in external rotation (Fig. 11b).
Step 3. The examiner anchors the patient's thigh to the table by placing his own knee in the patient's popliteal space cushioned by a small pillow or towel; then strongly distracts the patient's knee joint by lifting up on the foot following this by rapidly rotating the leg internally and externally (Fig. 11c).
Step 4. Step 3 is repeated with strong downward pressure on the patient's foot (Fig. 11d).

Note: An intermediate maneuver may be given between Steps 2 and 3, whereby the examiner flexes the patient's knee to ninety degrees and rapidly rotates the foot and leg internally and externally with no anchorage to rule out a rotational strain or collateral ligament tear.

Significance: A meniscus tear

Synonym: Apley's Grinding Test

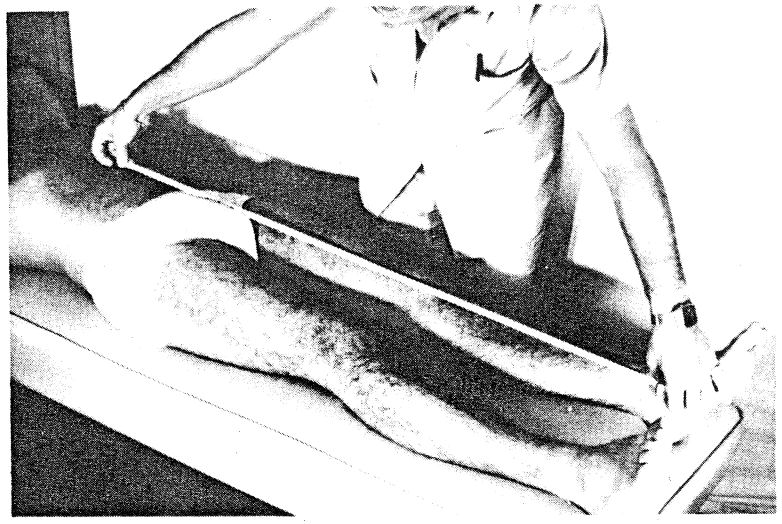
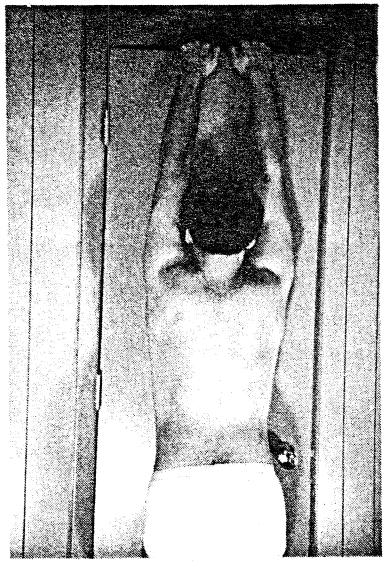


Figure 12

APPARENT LEG LENGTH: Test

Measurement from the umbilicus to the apex of the medial malleolus bilaterally (Fig. 12).

Significance: Is an index of the functional length of the lower extremities. An abduction contracture deformity causes apparent lengthening of the limb and an adduction contracture deformity causes apparent shortening because the pelvis is tilted sideways to make the legs parallel and the heel of the shorter side cannot be placed on the ground when the knees are straight. Thus the difference between the lower limbs is caused only by pelvic obliquity and measuring in this manner for a structural short leg is highly inaccurate.



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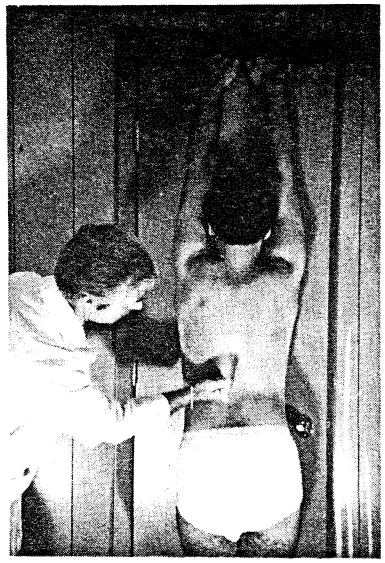


Figure 13 B

ASTROM SUSPENSION: Test

The primary candidate for this test is one in which tests putting tension on the sciatic nerve caused sciatica.

Procedure: The patient is suspended by his hands. One way to accomplish this is by holding on to the top part of a door so that the patient's feet do not touch the floor (Fig. 13a). In this position the lumbar regions are tapped by the examiner's fist, much like a punch test (Fig. 13b). When such tapotement in the suspended position does not elicit any pain, but does elicit pain when the patient stands on his feet, the test is positive.

Significance: Suspension of the body by the hands causes the weight of that section of the body below the lumbosacral articulation to exert sufficient traction to cause the herniated portion of the nucleus pulposus to retract to the point where there is no pressure on the spinal nerve roots which ordinarily causes sciatica. The test also can be used to determine if

traction treatment will have a beneficial effect on a disk syndrome patient.

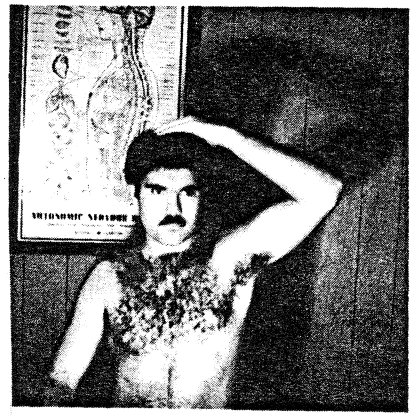


Figure 14

BAKODY: Sign

Procedure: The patient with cervical radicular pain actively places the palm of the affected extremity flat on the top of the head raising the elbow to a height approximately level with the head (Fig. 14). The sign is present when the radiating pain is lessened or absent by this maneuver.

Significance: Nerve root irritation by way of cervical foraminal compression.

Synonym: Cervical Foraminal Compression Test.

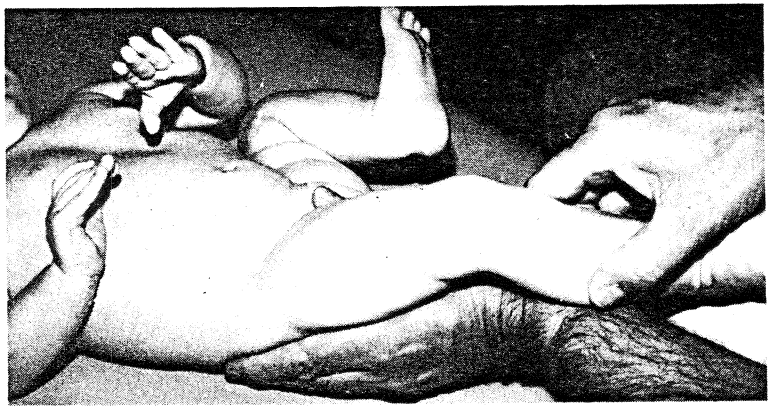


Figure 15 A

Figure 15 B

Figure 15 C

BARLOW'S: Test

Procedure: To examine the left hip in the newborn, the examiner fixes the pelvis of the supine infant with his left thumb on the pubis and his left long finger on the sacrum (Fig. 15a). With the right hand the examiner flexes the left hip and knee and fixes the femur with his right thumb on the lesser trochanter and his right long finger on the greater trochanter (Fig. 15b). The left hip is then abducted and pressure is applied to the greater trochanter with the examiner's right long finger (Fig. 15c). If the hip is dislocated, it will reduce with a palpable and sometimes visable jerk. Pressure on the lesser trochanter with the right thumb will then redislocate the hip (or will dislocate an unstable hip that happened to be reduced). The right hip is similarly examined with the hands of the examiner reversed.

Significance: Congenital dislocation of the hip

Figure 16 A

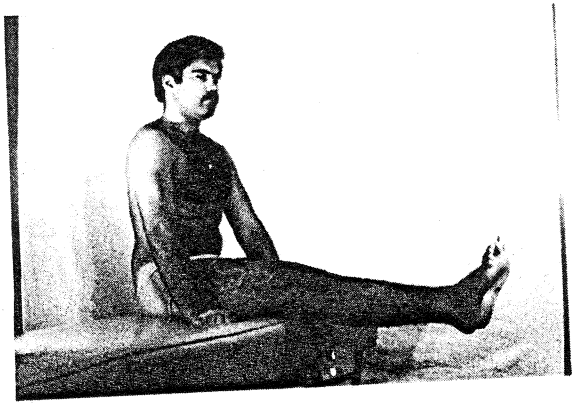


Figure 16 B

Figure 16 C

BECHTEREW'S SITTING: Test

Procedure: The patient is seated with legs dangling over the edge of an examining table. The examiner directs the patient to extend one knee straight out making that extremity parallel to the floor from the hip to the foot (Fig. 16a). The same procedure is repeated with the other knee followed by an attempt to extend both at the same time (Fig. 16b). The test is positive if: 1. The patient can do none of the maneuvers because of low back and/or radicular pain - or - 2. The patient can extend either extremity or both only by leaning the trunk backwards in a semisitting position (Fig. 16c) because of pain.

Significance: Most commonly an intervertebral disk protrusion causing an increase in neuralgia when the sciatic nerve is stretched over the abnormal prominence by this equivalent of straight leg raising.

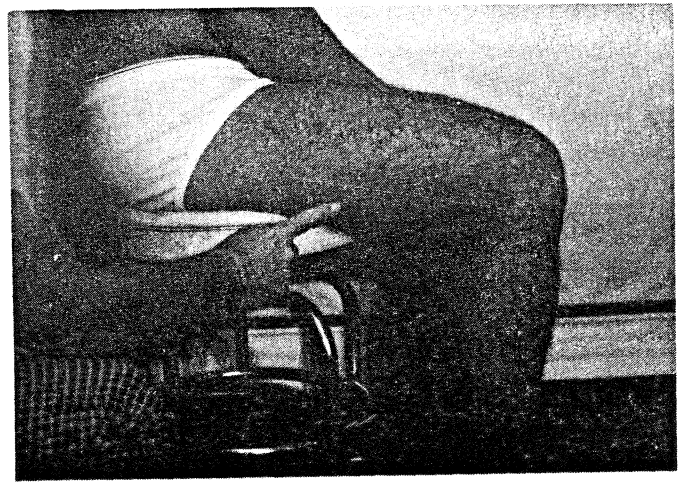


Figure 17

BEERY'S: Test

The test is positive when a patient with lower trunk discomfort while standing, is significantly relieved by sitting with the knees flexed (Fig. 17).

Significance: A positive test signifies hamstring muscle tightness or spasm to be a major part of the pain production. The conclusion previously held that a positive test indicates a pelvic rather than a lumbar lesion is inaccurate as the hamstring muscles may be spastic in any significant lesion of the spine from T8 to S1 levels.

Synonym: The "In A Chair" Test

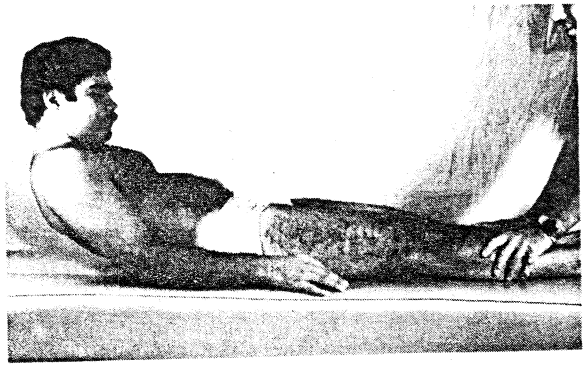


Figure 18 A

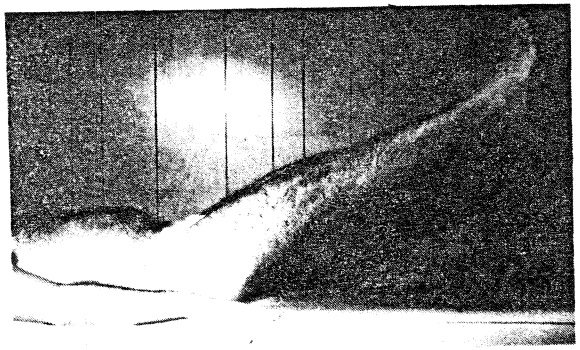


Figure 18 B

BEEVOR'S: Sign

Procedure: The patient from the supine position is asked to flex the neck, elevate the legs or sit up (Figs. 18a & 18b). The abdominal muscles are palpated and the umbilicus is observed. If there is equal strength in all four abdominal quadrants, the umbilicus will remain centered, will not move and the sign is not present. If any of the sides, upper, lower or lateral are weak or paralyzed, the umbilicus will move (Beevor's Sign) to the side opposite the weakness. The patient is asked to tense the abdomen, if the Transversus and Recti are paralyzed the abdomen tends to protrude and contraction cannot be palpated.

Significance: The sign is one of functional weakness or paralysis showing the inability of the patient to inhibit the unopposed pull of the antagonistic abdominal muscles. The level of a spinal cord lesion is localized as the umbilicus is innervated by the 10th thoracic segment and all muscles caudal to T10 are paralyzed if there is a transverse spinal cord lesion at this level.

Synonym: Umbilical Migration Test

Figure 19 A

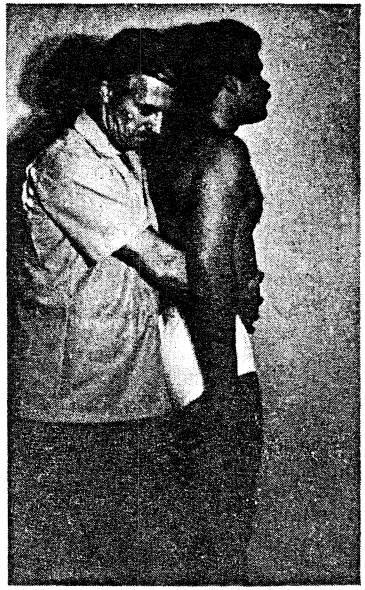


Figure 19 B

Figure 19 C

BELT: Test

Procedure: The patient with low back symptomatology in the standing position flexes the dorsolumbar spine while the examiner notes the amount of flexion necessary to significantly aggravate the pain (Fig. 19a). The examiner then standing behind the patient wraps his arms around the patient interlocking his fingers together over the abdomen below the iliac crests while bracing a hip against the patient's sacrum (Fig. 19b). The patient is directed to flex the spine again to the same degree as the examiner holds his position immobilizing the patient's pelvis (Fig. 19c).

Significance: If the lesion is pelvic in nature, flexing the spine with the pelvis immobilized will not aggravate the discomfort, if spinal in nature, the pain will be aggravated in both instances.

Synonym: The Supported Adam's Test

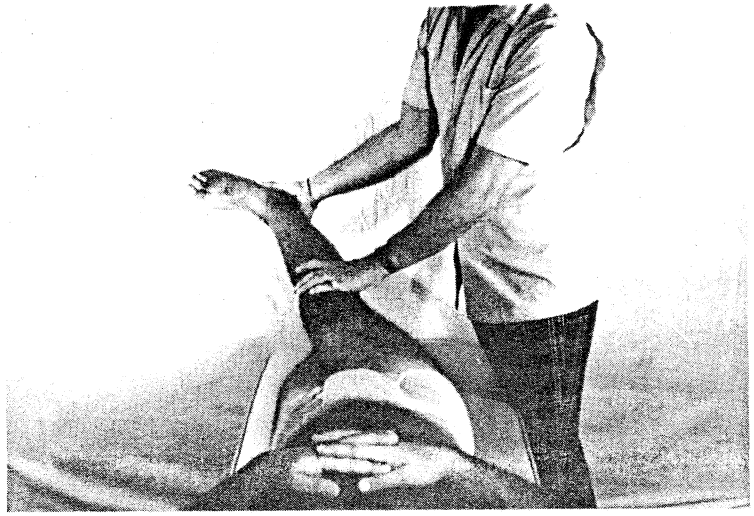


Figure 20 A

Figure 20 B

BONNET'S: Sign

Procedure: With the patient supine, the examiner on the side of radicular pain strongly internally rotates and adducts the lower limb (Fig. 20a) and then proceeds to perform straight

leg raising (Fig. 20b). The sign is present when this maneuver aggravates the pain response sooner or elicits more pain than when performing the Laseque Test.

Significance: Radiculopathy of the sciatic nerve; can be utilized in conjunction with the Laseque Test.

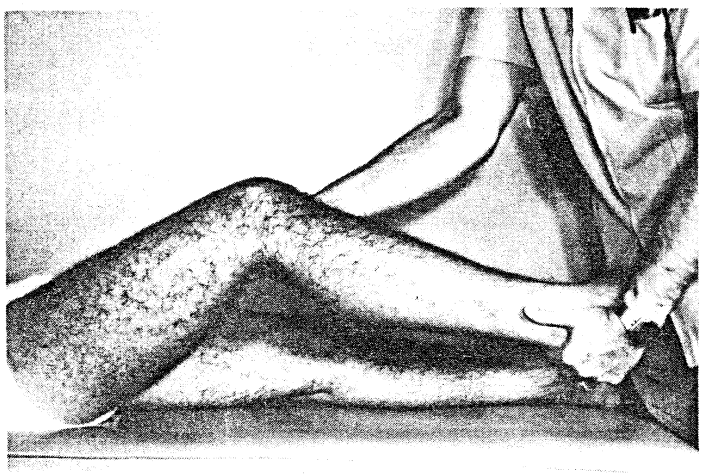


Figure 21 A

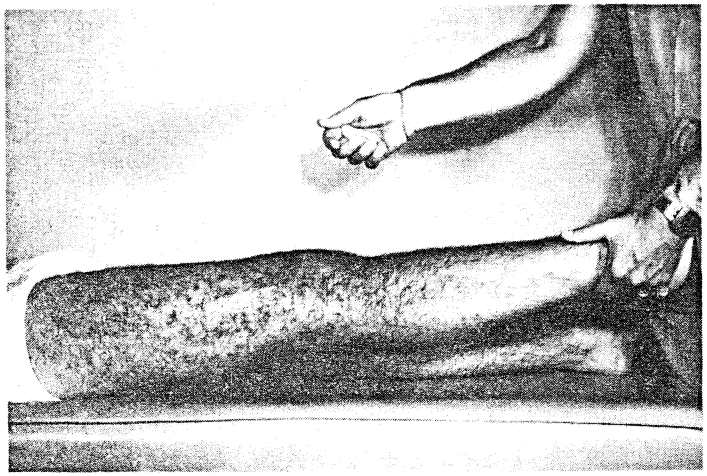


Figure 21 B

BOUNCE HOME: Test

Procedure: With the patient supine, the examiner raises the suspected lower limb from the table with one palm cupped under the heel and the other palm supporting the calf. With the knee in moderate flexion (Fig. 21a) and relaxed, the examiner makes the knee "bounce home" into extension by suddenly allowing the knee to fall while still cupping the heel (Fig. 21b). Normally there is a clean, sharp feeling and rebound when the knee reaches its extension end point which can be determined by performing this maneuver first on the sound side.

Significance: When the bounce home motion does not take place, the test is positive for knee pathology. (See KNEE DROP Test)

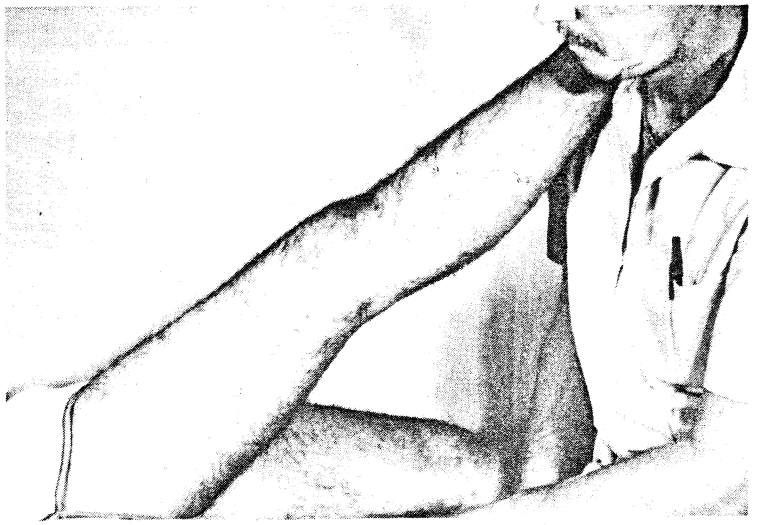


Figure 22 A

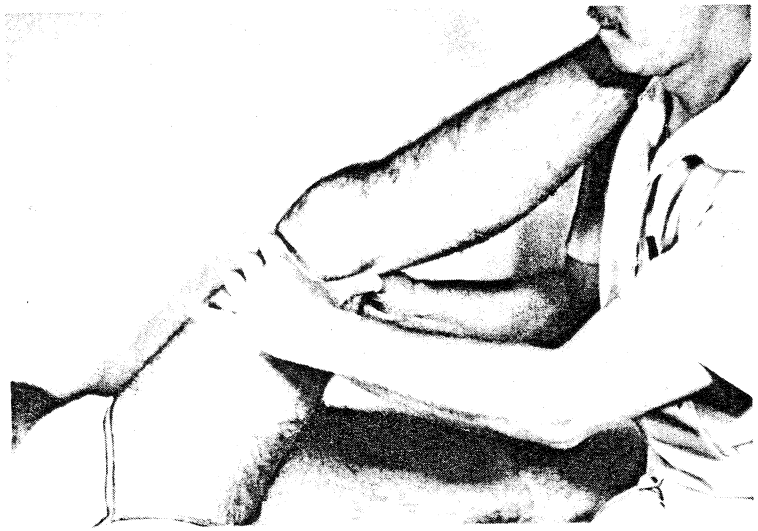


Figure 22 B

BOWSTRING: Sign

Procedure: With the patient in the supine position the examiner carries out straight leg raising to the point at which the patient experiences some discomfort. At this level the knee is slightly flexed and the examiner allows the foot to rest on his shoulder until the pain abates (Fig. 22a). At this point the examiner applies firm pressure to the hamstrings, when this does not produce pain the examiner moves his thumbs over the popliteal fossa and holding the patient's knee as straight as comfort will permit, applies sudden firm pressure with the thumbs over the popliteal nerve (Fig. 22b). Reproduction of pain in the leg or in the back shows the sign to be present. Local pain in the popliteal fossa is of no significance.

Significance: Considered by some to be irrefutable evidence of nerve root compression and the most single important sign in the diagnosis of a ruptured intervertebral disk.

Figure 23

BRACELET: Test

Procedure: The examiner gives mild to moderate lateral compression of the lower ends of the radius and ulna (Fig. 23) causing the production of acute forearm, wrist and hand pain.

Significance: Rheumatoid Arthritis

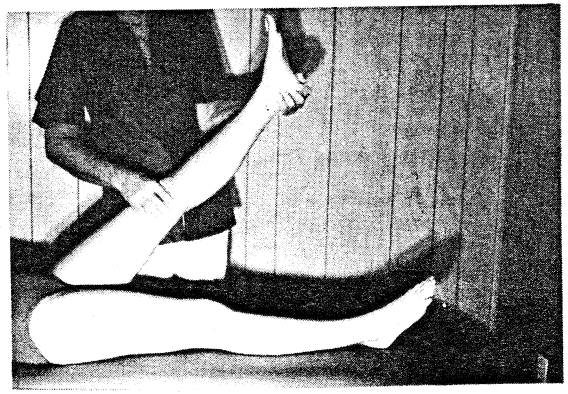


Figure 24 A

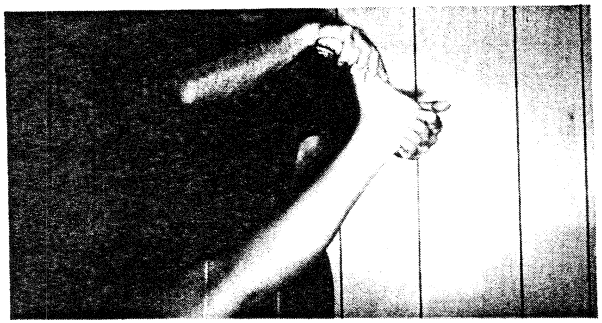


Figure 24 B

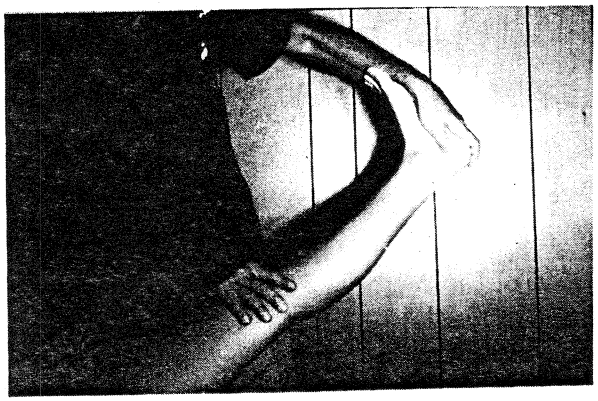


Figure 24 C

BRAGARD: Sign

Procedure: With the patient supine and both lower limbs straight and parallel, the whole extremity on the affected side is flexed on the hip until the patient experiences pain (Fig. 24a), with the lower limb held in this position the foot is strongly dorsiflexed (Figs. 24b & 24c). The sign is present if there is an **increase** in radicular pain from this action.

Significance: Peripheral or nerve root irritation of the sciatic nerve

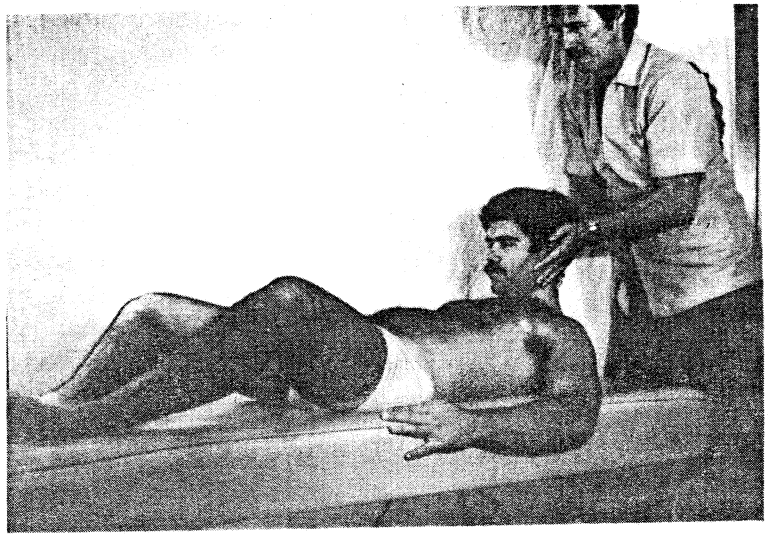


Figure 25 A

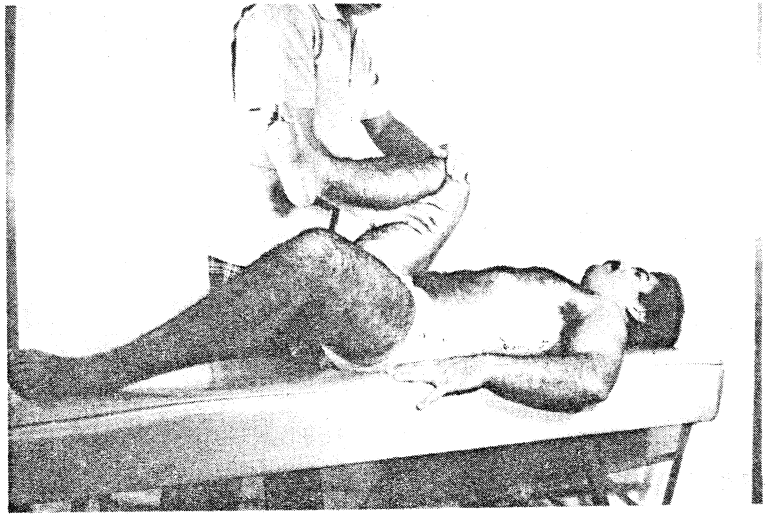


Figure 25 B

BRUDZINSKI: Sign

1. A somewhat inconstant sign occurring when forced flexion of the head and neck with the patient optimally supine causes flexion of both legs at the knees and

is frequently also accompanied by flexion of the hips bilaterally (Fig. 25a).

2. Brudzinski's Contralateral Signs: With the patient supine, when one thigh is passively flexed at the hip, the opposite thigh makes a similar movement (Fig. 25b).

Significance: Both are indications of Meningitis.

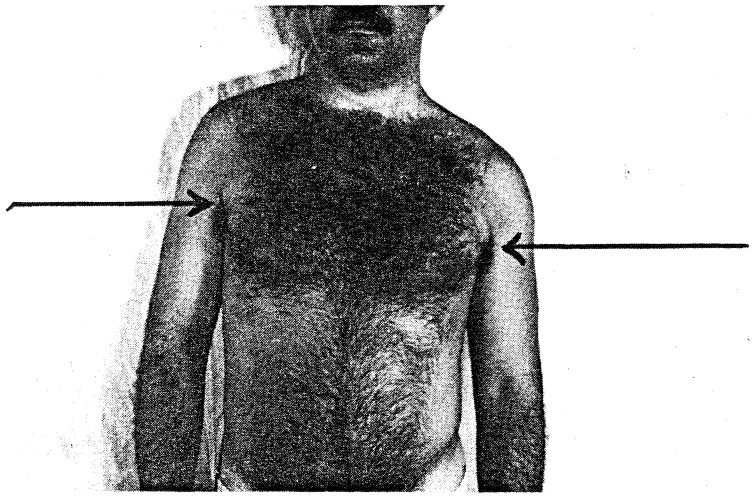


Figure 26

BRYANT'S: Sign

The characteristic lowering of the axillary folds (anterior and posterior pillars of the armpit) seen after trauma when dislocation of the glenoid-humeral articulation ensues (Fig. 26).

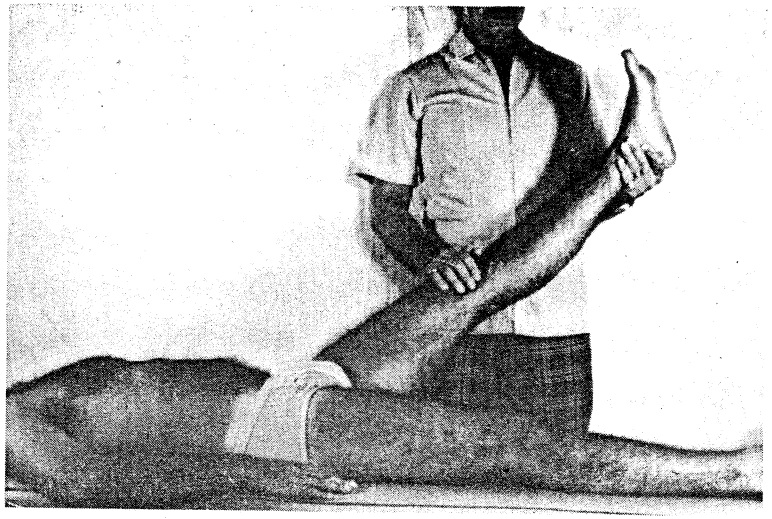


Figure 27 A

Figure 27 B

BUERGER'S: Test

Procedure: With the patient supine, the examiner elevates the leg with the knee extended to a comfortable tolerance of approximately forty-five degrees for a period of no less than three minutes (Fig. 27a). The limb is then lowered and the

patient sits up with both legs dangling side by side over the examining table for observation by the examiner (Fig. 27b).

Significance: The test measures arterial blood supply to the lower limbs. The blood supply is deficient if:

1. The dorsum of the foot blanches and the prominent veins collapse when the leg is initially raised - and/or
2. If, when the leg is lowered, it takes one to two minutes for a ruddy (reddish) cyanosis to spread over the affected part and for the veins to fill and become prominent.

Figure 28 A

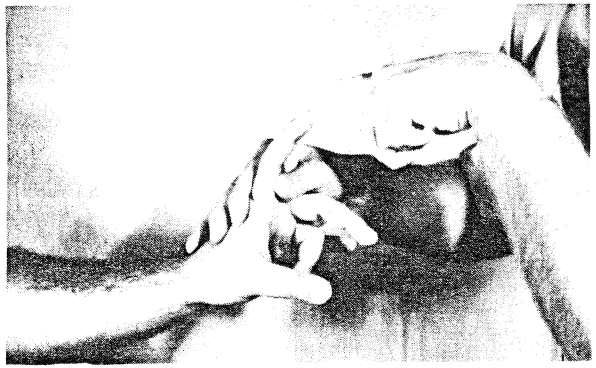


Figure 28 B

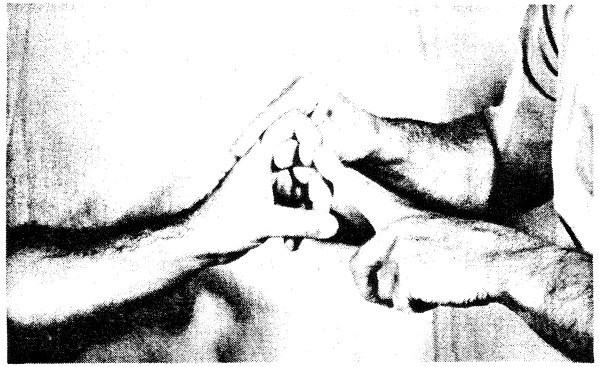


Figure 28 C

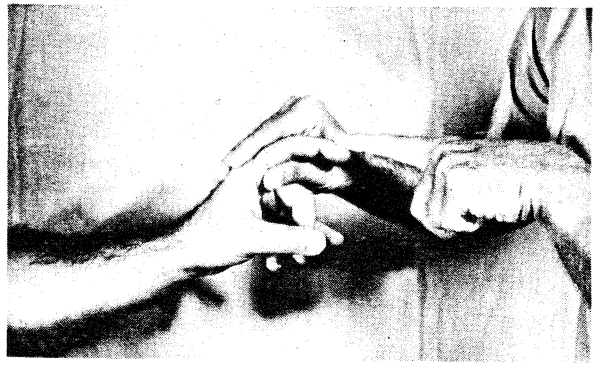


Figure 28 D

BUNNEL-LITTLER: Test

Procedure: This test is given in two phases. In phase I the examiner holds the metacarpophalangeal joint of the patient in slight extension (Fig. 28a) and then attempts to move the proximal interphalangeal joint into flexion (Fig. 28b). If the proximal interphalangeal joint cannot be flexed the test is positive for tightness of the intrinsic muscles or joint capsule contracture.

In phase II the examiner then flexes the metacarpophalangeal joint slightly and attempts to fully flex the joint (Fig. 28c).

Significance: If, after a positive phase I, the joint can be fully flexed in phase II, the intrinsic digital muscles are tight. If full

flexion is still restricted (Fig. 28d), the limitation is due to proximal interphalangeal joint capsule contracture.

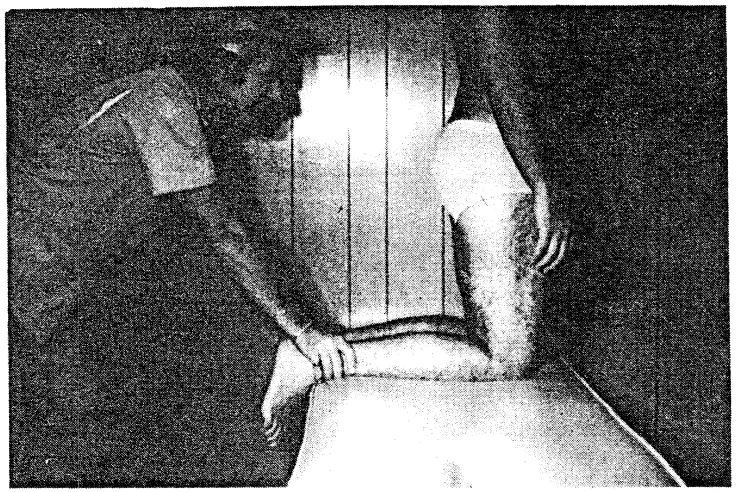


Figure 29 A

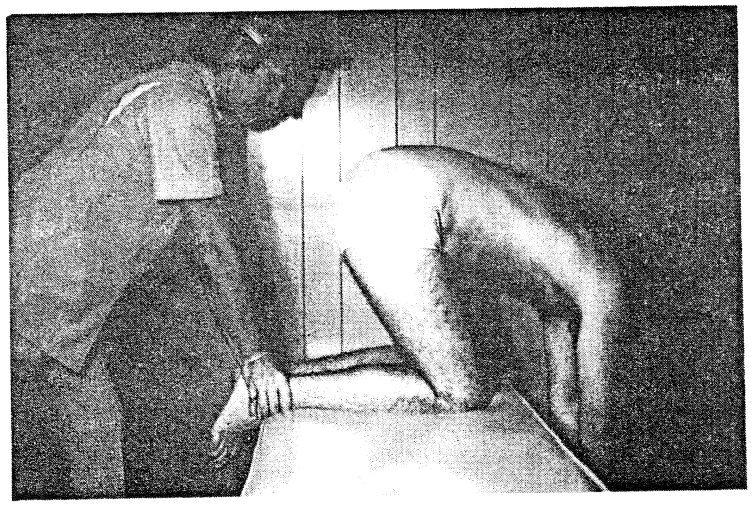


Figure 29 B

BURN'S BENCH: Test

Procedure: The patient is directed to kneel upright on a padded bench or table approximately eighteen inches high and to kneel as far forward as possible (Fig. 29a). The examiner then grasps the back of the patient's ankles and asks the patient to bend over and touch the floor with the fingertips (Fig. 29b).

Patients who cannot be expected to perform this test are those:

a. So weak by injury or disease that they cannot physically comply
b. Significantly diseased at the hip or knee

Patients who may be expected to perform the test are those:

1. With sciatic neuralgia - the test imposes no stress on the sciatic nerve
2. With congenital anomalies
3. With arthritis
4. With specific diseases of the spine, e.g. tuberculosis
5. With compression fractures of the spine

The test is positive when anyone other than those referred to in a and b above, either refuses to make an effort or performs part of it (goes to forty degrees or more) and then rises to the perpendicular stating that they cannot do it.

Significance: Evidence of malingering or hysteria

Synonym: The Kneeling Bench Test

Figure 30 A

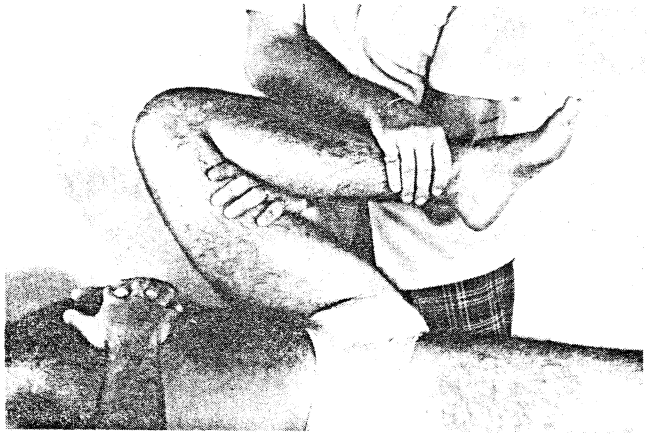


Figure 30 B

BUTTOCK: Sign (of the)

The sign is present when passive hip flexion with the knee held extended (e.g. straight leg raising) is limited and painful

(Fig. 30a), passive hip flexion with the knee flexed (Fig. 30b) is more or less as limited and painful and the pain comes directly from the buttock as opposed to the hip, lumboscral spine, etc. even though it spreads down the back of the thigh to the knee or calf.

Significance: In the presence of fever, inflammation of: the upper femur (osteomyelitis), sacroiliac joint (septic arthritis), ischio-rectal abscess or septic bursitis. In the absence of fever: neoplasm of the upper femur or iliac bone.

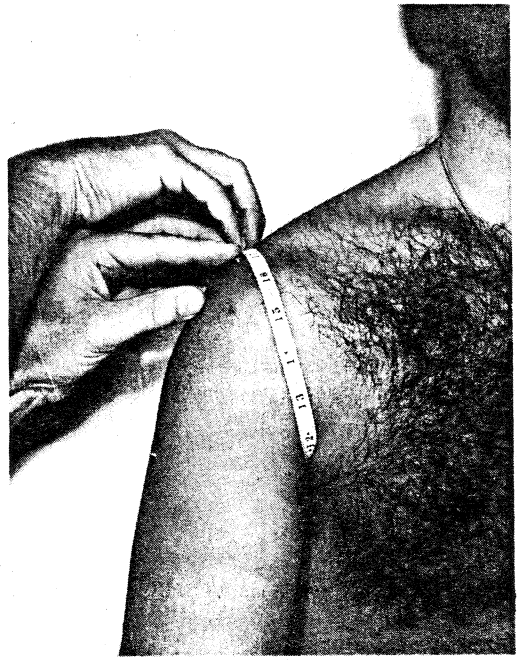


Figure 31

CALLOWAY'S: Test

The test consists of measuring the girth of the two shoulder joints and is very helpful in the examination of obese

patients.

Procedure: The examiner loops a flexible tape measure through the axilla and the girth is measured at the acrominal tip (Fig. 31). In a positive test the girth of the affected joint is increased.

Significance: Dislocation of the humerus

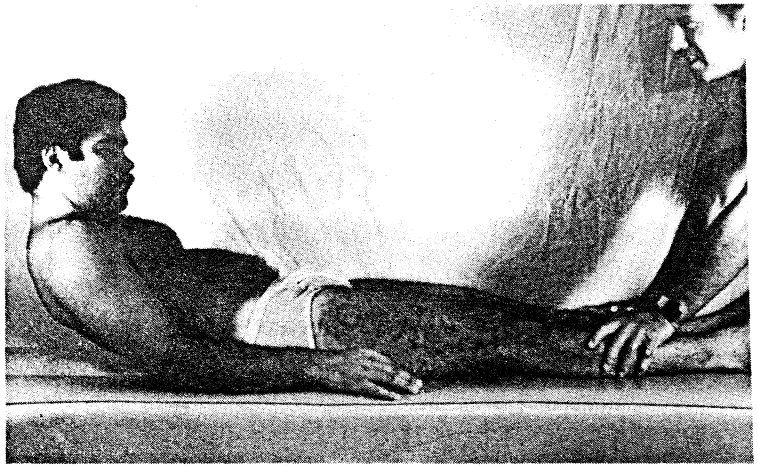


Figure 32

CHAPMAN'S: Test

Procedure: The patient is directed to assume a supine position, arms resting at the sides. The patient is then told to slowly sit up without the aid of the upper limbs by strongly contracting the abdominal muscles and raising himself by this contraction alone (Fig. 32). The test is positive when the patient feels great pain in rising or cannot rise due to abdominal pain.

Significance: An acute inflammatory abdominal lesion

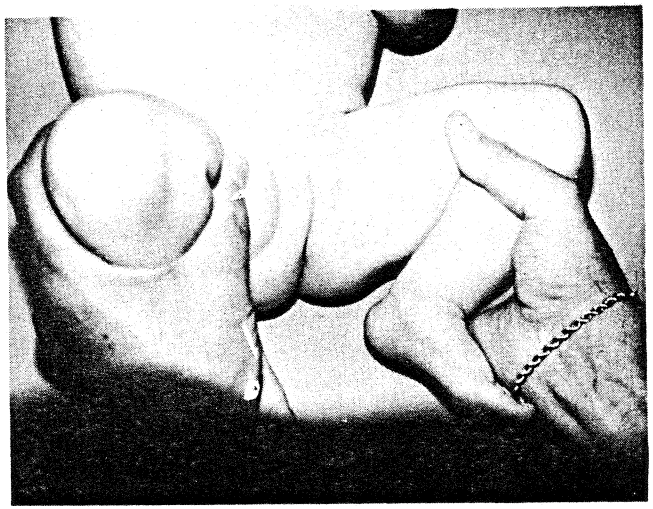


Figure 33 A

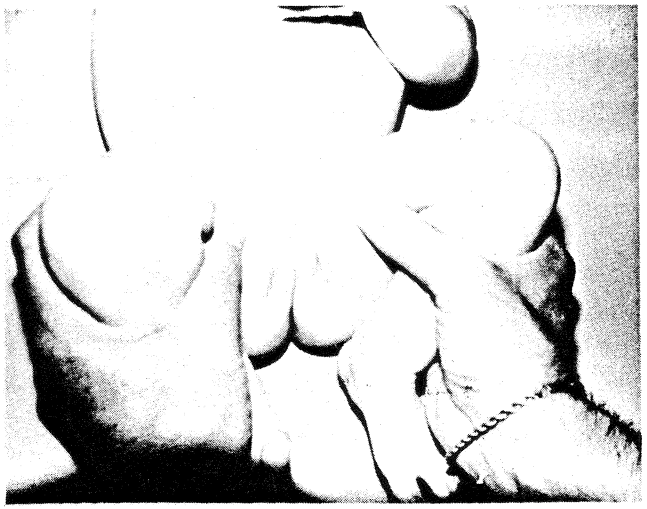


Figure 33 B

CHAPPLE'S: Sign

With the infant (under three months of age) supine, the examiner flexes the thigh to ninety degrees and from this position attempts to abduct it. Normally the hip can be abducted to approximately ninety degrees (Fig. 33a). The sign

is present when no more than forty-five degrees can be attained with a splinting of the hip joint present (Fig. 33b).

Significance: Congenital dislocation of the hip.

Synonym: Hart's Sign (In this sign the adductor muscles on the affected side are felt to be tight or contracted.)

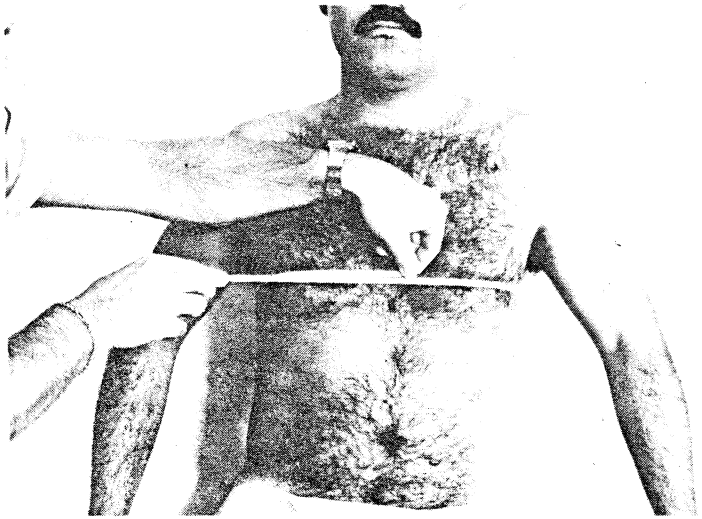


Figure 34

CHEST EXPANSION: Test

Procedure: The patient optimally is standing or sitting erect. The examiner transversly encircles the thoracic cage with a flexible tape measure passing over the lowest part of the 4th intercoastal space (Fig. 34). The patient is instructed to maximally exhale and a reading is taken with the tape pulled taut, the patient is then directed to maximally inhale and the procedure is repeated.

Normal expansion for adult males is two inches or more, for

adult females is one and one-half inches or more.

Significance: Subnormal expansion indicates thoracic fixation and is an important sign in such ankylosing conditions as Marie-Strumpell Disease.

Figure 35 A

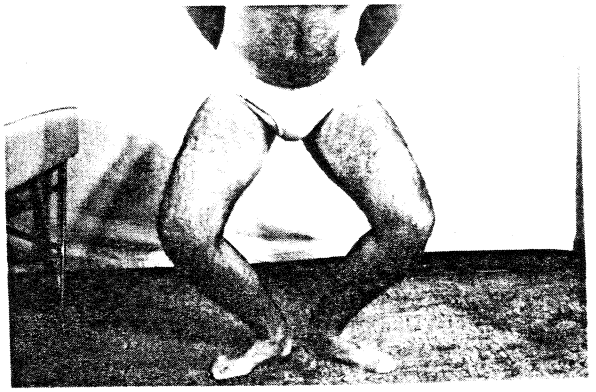


Figure 35 B

CHILDRESS DUCK WADDLE: Test

Procedure: The patient stands with the feet somewhat apart and the legs in maximal internal rotation; a full squat is then attempted. During this maneuver the patient's heels may come up from the floor with weight-bearing passing somewhat to the balls of the feet (Fig. 35a). The maneuver is then repeated with the lower limbs in maximal external rotation (Fig. 35b).

A positive test consists of pain, inability to fully flex the knee and/or a clicking sound on either posterior side of the joint.

Significance: a positive test during internal rotation suggests a medial meniscus tear, during external rotation a lateral meniscus tear.

CLAUDICATION: Test (not illustrated)

Procedure: The patient walks at a rate of one hundred and twenty steps per minute, the time being kept up to sixty seconds. This can be accomplished with the patient on a treadmill or measured steps up and down or around a room. The time elapsing between the start of the test and the occurance of leg cramps related in seconds is designated the "Claudication Time." The site of the cramping and in many cases the color change (pallor) in the tissues identifies the level of the lesion.

Significance: Peripheral vascular disease of chronic arterial occlusion

Figure 36 A

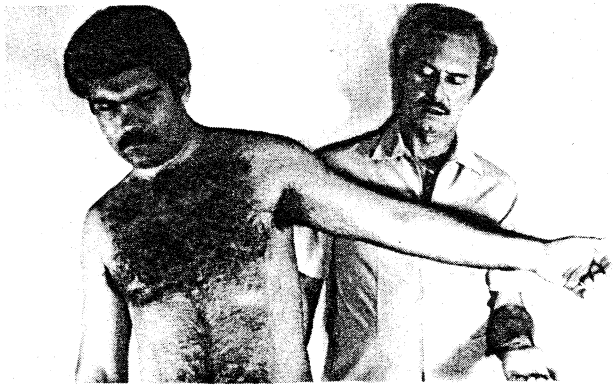


Figure 36 B

CODMAN'S: Sign

Procedure: The sign is present when, with a shoulder complaint, the patient's arm can be passively abducted with no pain (Fig. 36a). But should the examiner suddenly remove the support at some point above the horizontal (Fig. 36b) making the deltoid contract suddenly, there occurs shoulder pain and a hunching of the shoulder due to the absence of rotator cuff function as the patient attempts to maintain the abduction.

Significance: Rotator cuff tear - Rupture of the Supraspinatus Tendon

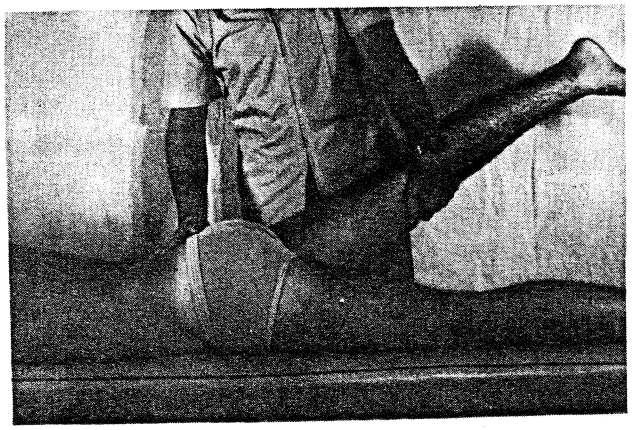


Figure 37 A

Figure 37 B

COPE'S: Sign/Test

The sign is present when, during the course of an examination of the right hip, the examiner, either by chance or design, stretches the Psoas muscle by extending the thigh (Fig. 37a)

causing abdominal pain.

The test is given by way of the examiner, with the patient supine, flexing and interally rotating the right hip joint (Fig. 37b) and causing pain to be felt in the hypogastrium.

Significance: Both of the above procedures irritate an inflammed appendix

Synonym: Obturator Test

Figure 38 A

Figure 38 B

Figure 38 C

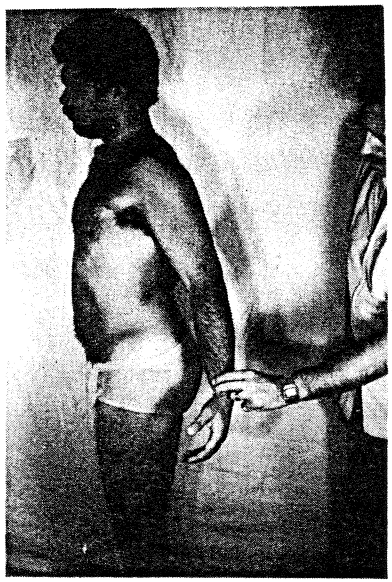


Figure 38 D

COSTOCLAVICULAR: Maneuvers/Tests

Procedure 1. The patient stands, arms at right angles to the body and forearms at right angles to the arms (hostage position) with the hands in the same coronal plane as the head (Fig. 38a). The patient is then directed to externally rotate the arms to a maximal backward position (Fig. 38b).

Procedure 2. With the patient sitting, the examiner from behind grasps both shoulders pulling them downward and backward (Fig. 38c).

Procedure 3. The patient assumes the exaggerated military position, with the shoulders drawn downward and backward actively (Fig. 38d). Note: This particular procedure when used separately is known as EDEN'S TEST.
A positive test is comprised of any of the following upper limb neurovascular compression findings as the limbs are held in the above positions: a) cessation or dampening of the radial pulse b) ischemic color changes, e.g. pallor, blanching, etc. c) paresthesiae and d) upper limb radicular pain.

Significance: Thoracic outlet syndrome, Costoclavicular type. All of the above procedures narrow the space between the clavicle and the first rib (the costoclavicular space or interval) thus compressing unduly the neurovascular tissues of the Subclavian artery and vein and the Brachial plexus.

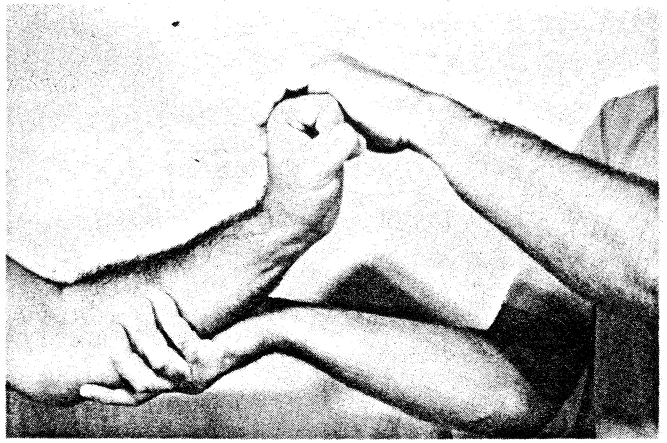


Figure 39

COZEN'S: Test

Procedure: The patient is directed to tightly clench the fist, dorsiflex it and maintain that position. The examiner while grasping the lower forearm, applies a flexing force counter to the opposing dorsiflexion posture of the patient (Fig. 39).

A positive test reveals characteristic reproduction of acute lancinating pain in the region of the lateral epicondyle.

Significance: Tennis Elbow (Epicondylitis; Radiohumeral Bursitis)

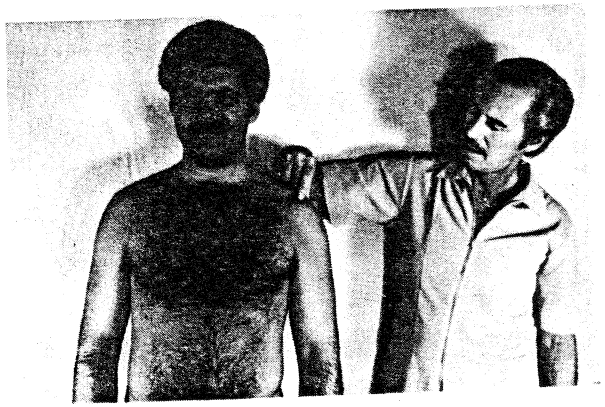


Figure 40 A

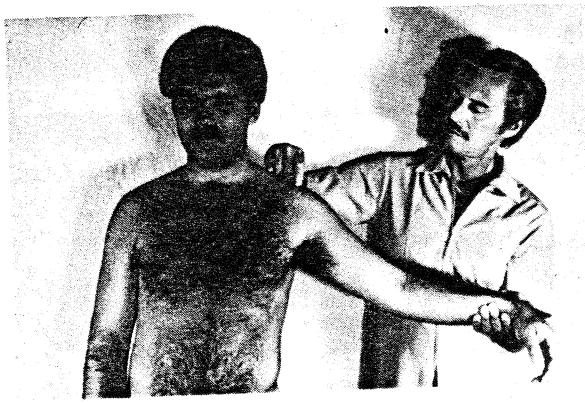


Figure 40 B

Figure 40 C

DAWBARN'S: Sign

Procedure: With the patient's arm hanging loosely at the side, deep palpation of the shoulder by the examiner elicits a well localized tender area (Fig. 40a). With the examiner's finger still on the painful spot, the patient's arm is passively abducted by the examiner's other hand (Fig. 40b). The sign is present when, as the arm is abducted, the painful spot disappears under the non-moving examiner's finger (Fig. 40c).

Significance: Subacromial Bursitis

Figure 41

DEJERINE'S: Sign

The sign is present when coughing, sneezing, straining at the stool or otherwise compressing the abdominal contents exacerbate low back discomfort and/or radicular pain (Fig. 41).

Significance: All of the above raise intraspinal fluid pressure which when occluded by a mechanical obstruction, e.g. herniated disk, tumor or bony closure, will aggravate radicular pain.

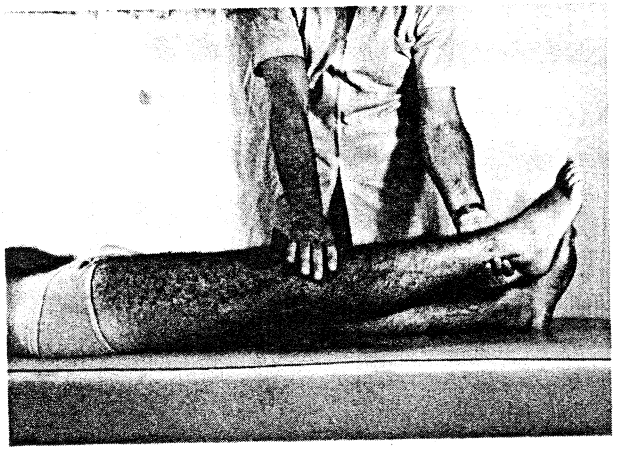


Figure 42

DEMIANOFF'S: Sign

With the patient in the supine position, the examiner performs straight leg raising. The sign is present when, in the patient with lumbago, this action produces a pain in the lumbar region which prevents raising the leg high enough to form an angle of fifteen degrees, or even less, with the table or bed the patient is lying on (Fig. 42).

Significance: The sign differentiates pain originating in the sacrolumbalis muscles from lumbar pain of any other origin. When present it shows the pain is due to the stretching of the sacrolumbalis (Iliocostalis Lumborum Muscle).

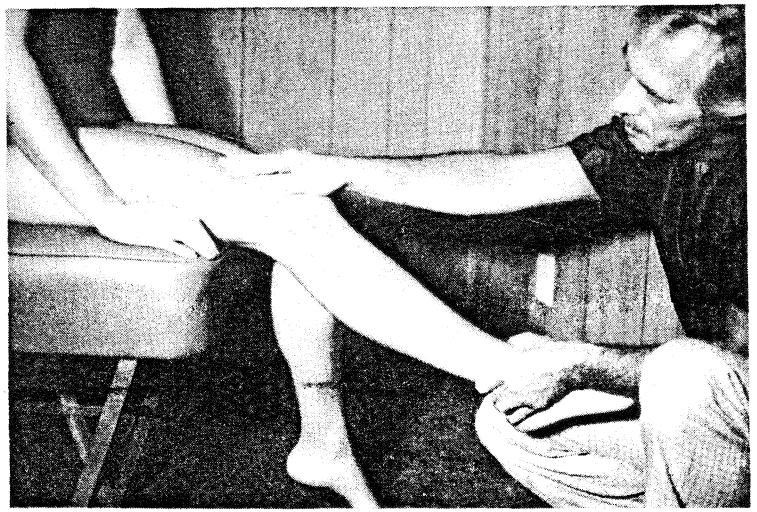


Figure 43 A

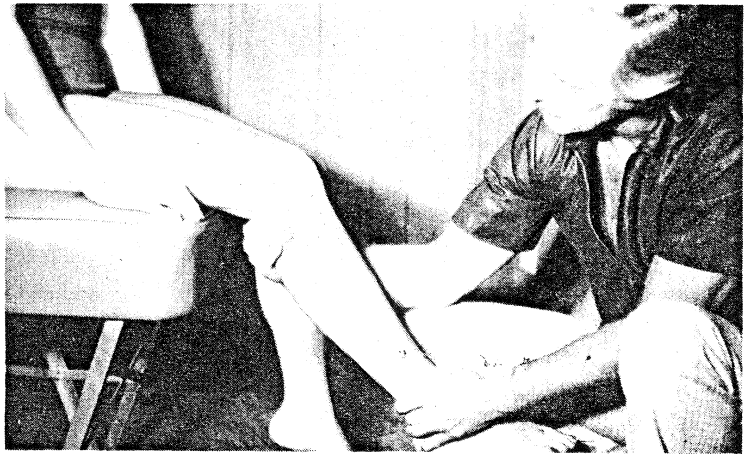


Figure 43 B

DEYERLE'S SCIATIC TENSION: Test

Procedure: With the patient seated, the affected leg is extended passively at the knee to the point at which pain is reproduced (Fig. 43a). The knee then is slightly flexed and strong pressure is applied manually by the examiner in the popliteal fossa (Fig. 43b). The test is positive if radiculitis symptoms are increased.

Significance: The test shows irritation of the sciatic nerve above the knee caused by stretching the nerve over an abnormal mechanical obstruction.

Synonym: Deyerle's Sign; Popliteal Press Test.

Figure 44 A

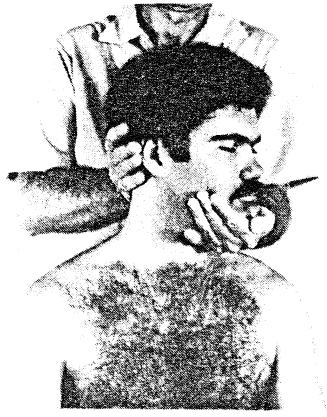


Figure 44 B

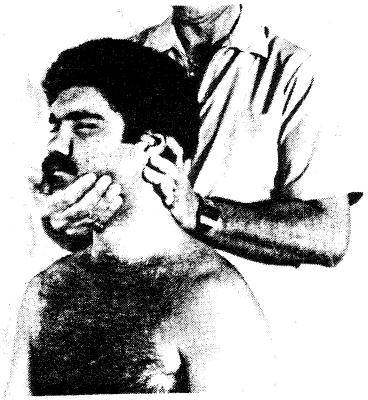


Figure 44 C

Figure 44 D

DISTRACTION: Test

In this test the patient with cervical and/or radicular shoulder-arm-hand pain gets relief when the examiner applies cervical traction to the head.

Procedure: The patient, to the extent he is able, actively rotates the head and neck until radicular pain is produced (Fig. 44a), the examiner standing behind the patient cups one hand under the patient's chin and the other under the occiput and giving strong upward traction passively rotates the

patient's head to the same extent as that which produced pain (Fig. 44b). The test is positive when the passive rotation under traction either: gives relief, finds the patient indifferent to the motion, or gives significantly less discomfort than the patient's active rotation.

Note: If the patient is unable to rotate the head or the neck due to pain, the test can be carried out with the examiner giving traction with or without rotation (Figs. 44c & 44d).

Significance: Nerve root compression

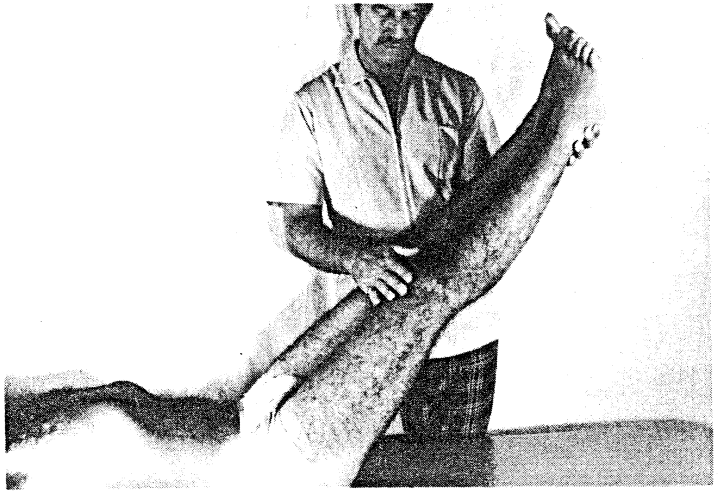


Figure 45

DOUBLE LEG RAISE: Test

Procedure: With the patient supine, the examiner performs straight leg raising on each lower extremity separately, noting the angle at which pain is produced. Then both lower limbs are straight leg raised together symmetrically (Fig. 45). When pain is produced at an earlier angle by raising both legs together than with either raised by itself, the test is positive.

Significance: The test is specific and highly accurate for lumbosacral joint involvement.

Figure 46 A

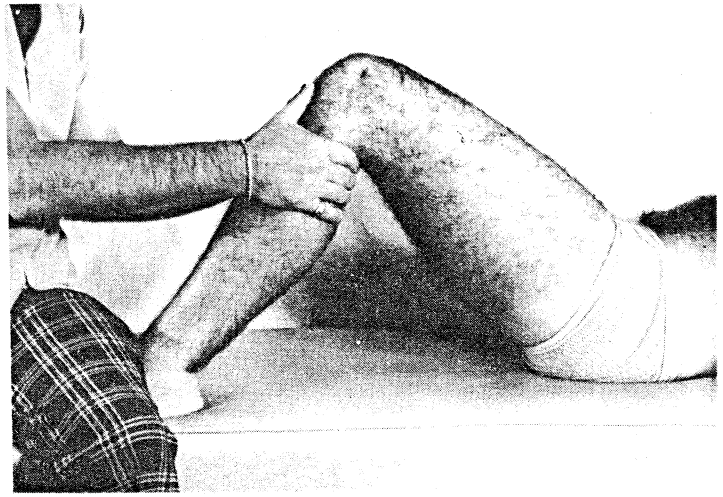


Figure 45 B

DRAWER: Test

Procedure: The patient is supine, the hip flexed forty-five degrees, the knee flexed approximately ninety degrees, the foot planted on the examining table and the examiner's buttock sitting partially upon the patient's forefoot to provide stability (Fig. 46a). The test is divided into an anterior and posterior part. The examiner places a hand medially and laterally grasping the leg just below the knee joint (Fig. 46b). With initial mild pressure, a to-and-fro, push and pull is exerted as the examiner moves the patient's lower leg forward and backward several times under the distal femur. This examination is then repeated with the tibia first externally and then internally rotated, with such rotation controlled by the examiner sitting on the patient's foot.

Significance: Classically an abnormal increase in anterior mobility is designated an Anterior Drawer Sign and indicates complete rupture of the Anterior Cruciate Ligament; an increase in posterior mobility is designated as a Posterior Drawer Sign and indicates a complete rupture of the Posterior Cruciate Ligament. When there is no abnormal mobility but either test causes acute pain described as coming from the center of the joint, a partial rupture of the respective cruciate ligaments is evidenced.

Note: Traditionally described as a test for anterior and posterior cruciate integrity, there are other ligaments and fascial bands which are associated with knee stability in this lateral plane. The part these structures play is dependent upon the rotational position of the tibia or the femur during the Drawer Maneuver (see STRESS Tests).

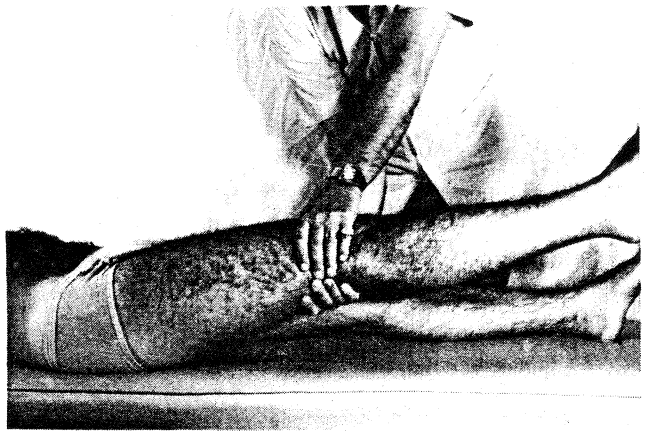


Figure 47

DREYER'S: Sign

Procedure: With the patient supine and the knee extended, the patient is unable to actively raise the leg. When the examiner applies forceful extension to the thigh by using the flat of the hands (Fig. 47) to give anchorage to the quadriceps, the patient is able to lift the leg. When this extension force is removed, the inability to raise the leg recurs.

Significance: Fracture of the patella

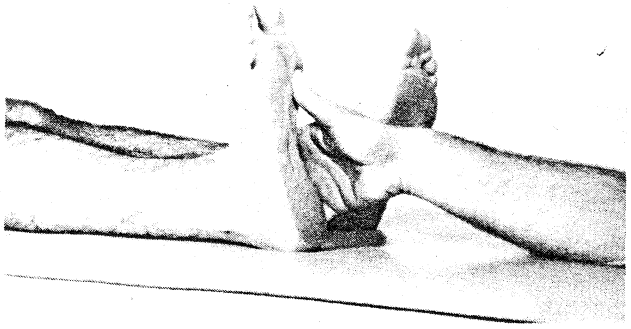


Figure 48 A

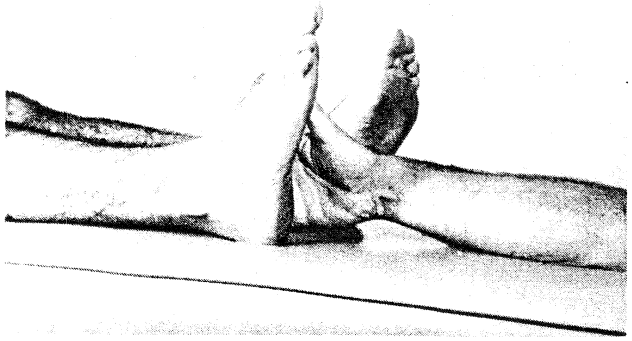


Figure 48 B

DUCHENNE'S: Sign

Procedure: The examiner pushes up (dorsally) the head of the first metatarsal with his thumb (Fig. 48a), and asks the patient to plantar flex the foot. The sign is present when the medial border of the foot dorsiflexes with the lateral border plantar flexing (Fig. 48b). The head of the first metartarsal offers no resistance to the pushing thumb, the plantar crease runs from the medial side of the big toe laterally to the heel and the arch disappears.

Significance: Paralysis of the Peroneus Longus due to a lesion of the Superficial Peroneal Nerve or a lesion at or above L4, L5 and S1 roots.

Figure 49

DUGAS': Test

Procedure: The patient with a shoulder injury places the hand of the affected side on the opposite shoulder (Fig. 49) and then attempts to bring the elbow flush against the chest. Inability to perform this action actively is a positive test.

Significance: Shoulder dislocation

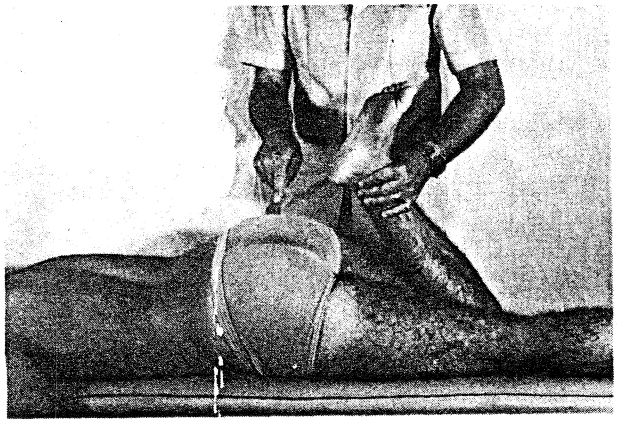


Figure 50

ELY'S: Sign

Procedure: With the patient prone, the knee is flexed toward the buttock on the same side. The sign is present when the pelvis rises from the table somewhat in unison with the knee flexion and the thigh goes into abduction at the hip joint (Fig. 50).

Significance: Rectus Femoris and/or lateral thigh fascia contracture

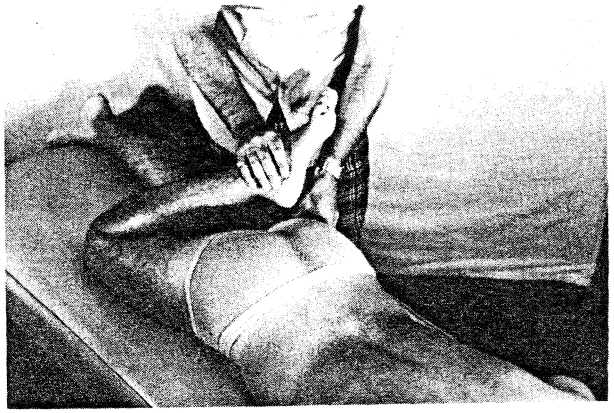


Figure 51 A

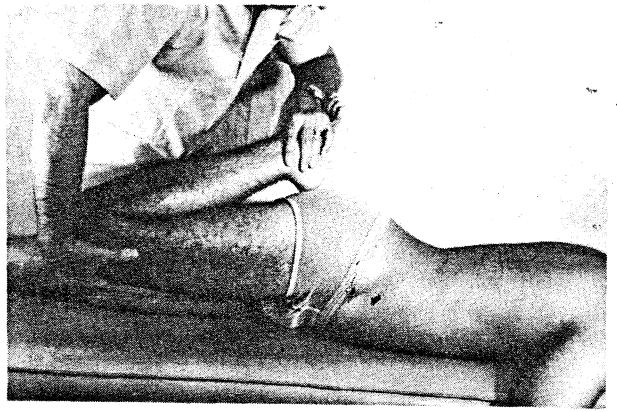


Figure 51 B

ELY HEEL TO BUTTOCK: Test

Procedure: This is a two stage test performed with the patient prone; in the first stage the knee is flexed approximating the heel to the opposite buttock (Fig. 51a), from this position the thigh is hyperextended (Fig. 51b).

Significance: 1. In any significant hip lesion it will be impossible to do the test normally. 2. In irritation of the Iliopsoas muscle or its sheath it will be impossible to extend the thigh to any normal degree. 3. Inflammation of the lumbar nerve roots will be aggravated with production of femoral radicular pain. 4. Lumbar nerve root adhesions will be stretched with the production of upper lumbar discomfort.

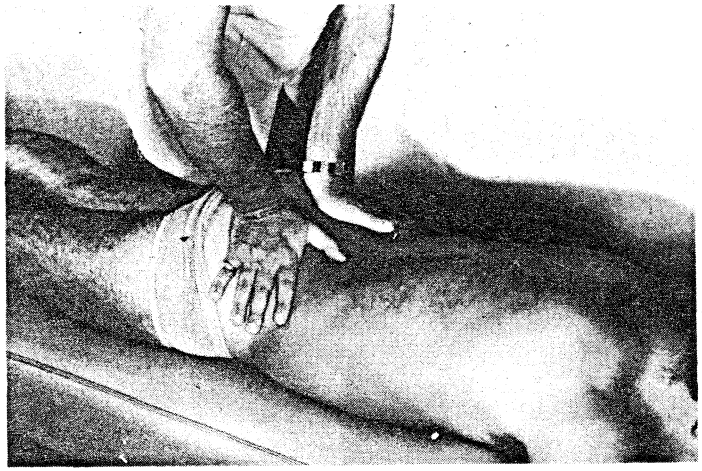


Figure 52

ERICHSEN'S: Sign

With the patient prone, the examiner places his hands over the dorsum of the ilia and proceeds to give forceful sharp thrusts bilaterally toward the midline (Fig. 52). The sign is present when this procedure produces pain over the sacroiliac area.

Significance: Pain is felt in sacroiliac joint disease but not in hip joint disease.

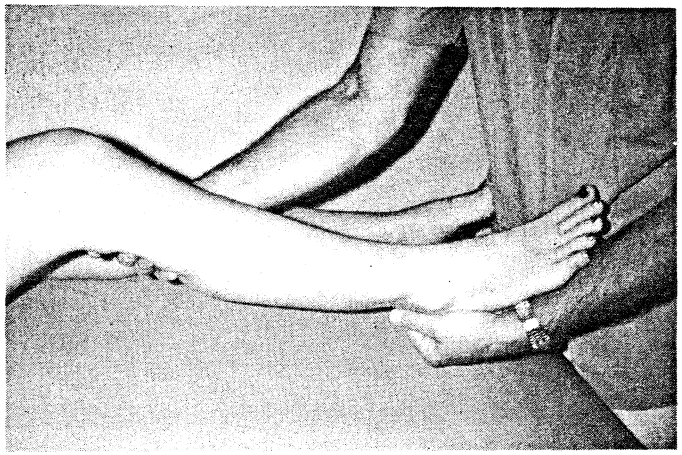


Figure 53

EXTERNAL ROTATION RECURVATUM: Test

Procedure: The patient is positioned supine and the lower extremity is grasped with one hand under the heel and the other supporting the calf with the knee approximately 10 degrees in flexion (Fig. 53). Removing the hand supporting the calf, the knee is allowed to fall from this flexion into full extension.
A positive test is indicated when the knee assumes a position of slight recurvatum, the tibia externally rotates and there is increased tibia vara.

Significance: Injury to the arcuate complex (arcuate ligament, popliteus, and fibular collageral ligament); and the lateral one half of the posterior capsule with some degree of injury (not complete rupture) to the posterior cruciate ligament.

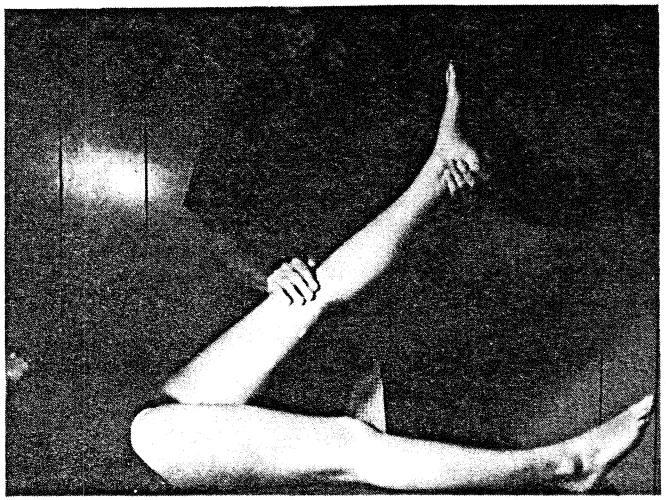


Figure 54 A

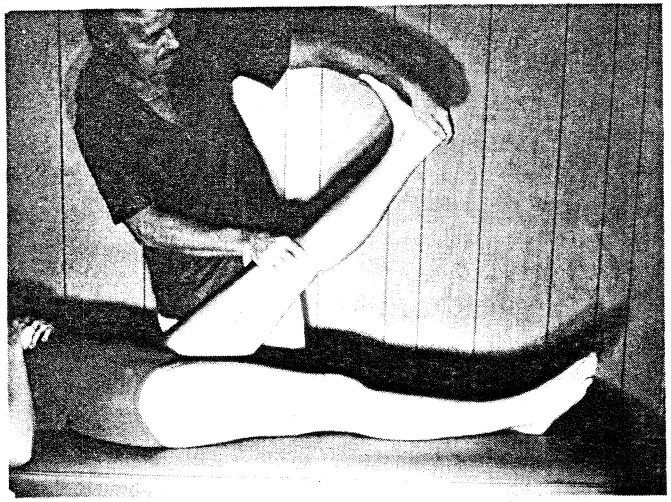


Figure 54 B

FAJERSZTAJN'S: Test

Procedure: In unilateral sciatica the examiner straight leg raises the unaffected limb until it causes or increases the opposite side radiculitis (Fig. 54a); if none is produced by this maneuver, strong dorsiflexion of the foot is added to the

straight leg raising (Fig. 54b). The production of radicular pain on the opposite side by either of these two actions is a positive test.

Significance: Sciatica produced at the nerve root level - is a confirmatory test for a ruptured disk lesion

Synonyms: Well Leg Raising Test; Crossed Sciatic Sign; Lasegue Contralateral Sign

Figure 55 A

Figure 55 B

Figure 55 C

FINKLESTEIN'S: Test

Procedure: The examiner with one hand stabilizes the patient's forearm and with the other hand grasps the patient's thumb so that both the thumb and hand of the patient can be stressed ulnarward (Fig. 55a). Normally this forceful ulnar deviation (Fig. 55b) is done from the neutral position but can also be applied in dorsi- and volar flexion. The test can also be done actively by the patient making a fist over the thumb and moving the wrist maximally ulnarward (Fig. 55c). Marked pain production in the region of the radial styloid process reveals a positive test.

Significance: DeQuervain's Disease (Stenosing Tenosynovitis/Tenovaginitis of the Adductor Pollicis Longus and the Extensor Pollicis Brevis muscles)

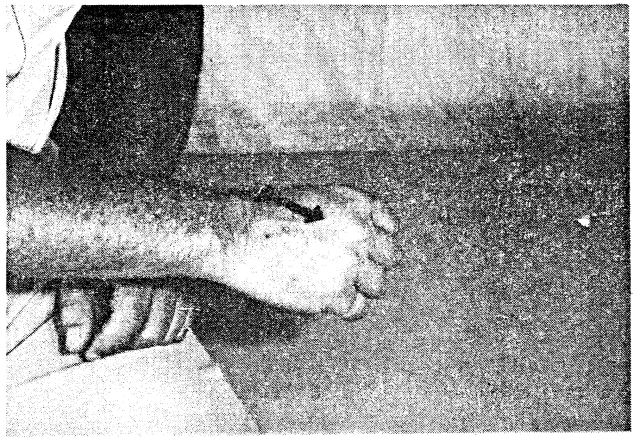


Figure 56 A

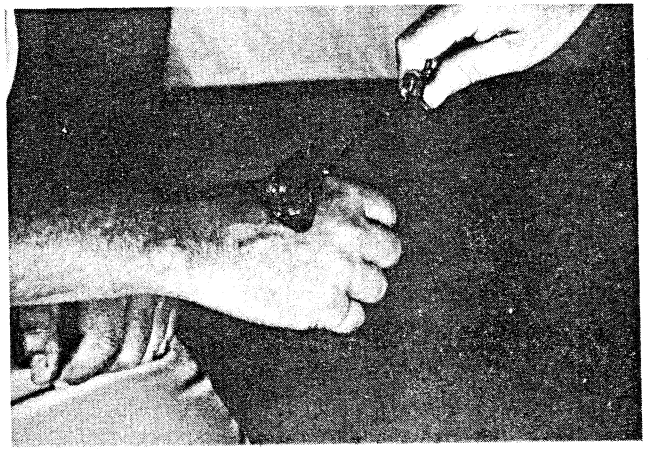


Figure 56 B

FINSTERER'S: Sign

The sign is present when grasping an object hard, clenching the hand or making a fist fails to show the normal prominence of the third metacarpal (Fig. 56a) on the dorsal surface and percussion of the third metacarpal elicits tenderness (Fig. 56b) just distal to the center of the wrist joint.

Significance: Kienbock's Disease (Aseptic Necrosis of the Lunate)

Figure 57 A

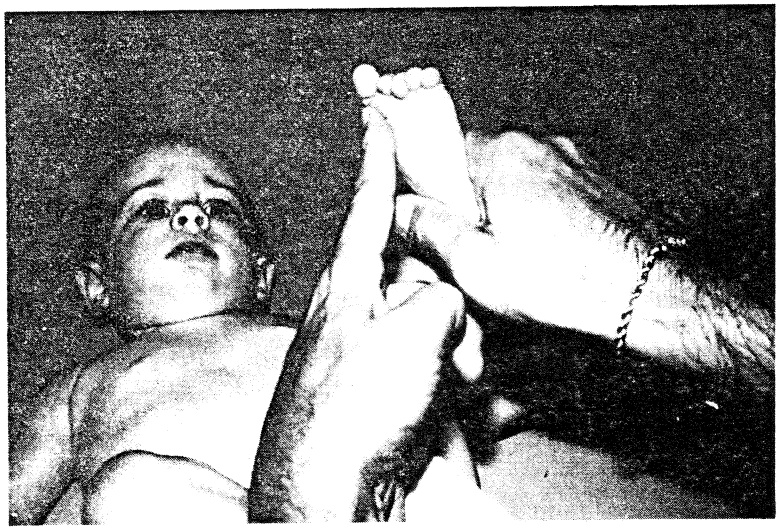


Figure 57 B

FOREFOOT ADDUCTION CORRECTION: Test

Procedure: With a child lying supine or being held in a similar position, the examiner stablizes the heel of the foot by holding it between the thumb and forefinger (Fig. 57a). Then with the other hand the examiner exerts digital pressure against the medal aspect of the forefoot. The test is positive if the forefoot can be abducted manually beyond the neutral position (Fig. 57b).

Significance: If the foot can be abducted beyond the neutral position (a straight line bisecting the center of the heel and the junction of the 2nd and 3rd toes) no treatment for an adduction deformity is necessary. If, however, the foot does not abduct beyond the neutral position, appliance or cast correction is necessary.

Figure 58 A
Foreistier's Sign

Figure 58 B
Normal

FORESTIER'S BOWSTRING: Sign

Procedure: The standing patient performs side bending and reveals ipsilateral tightening and contracture of the paraspinal musculature (Fig. 58a). Normally the contralateral musculature shows tightening (Fig. 58b).

Significance: Marie-Strumpell's Disease (Ankylosing Spondylitis)

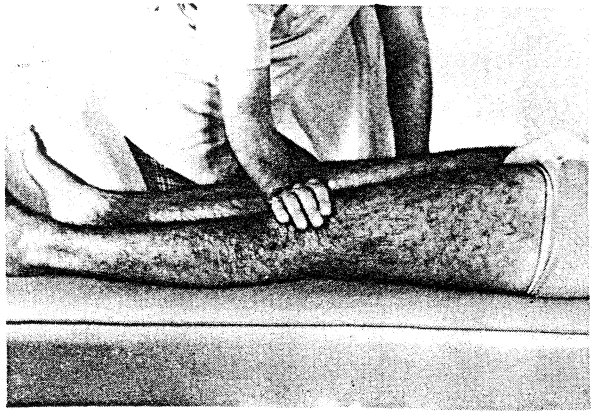


Figure 59 A

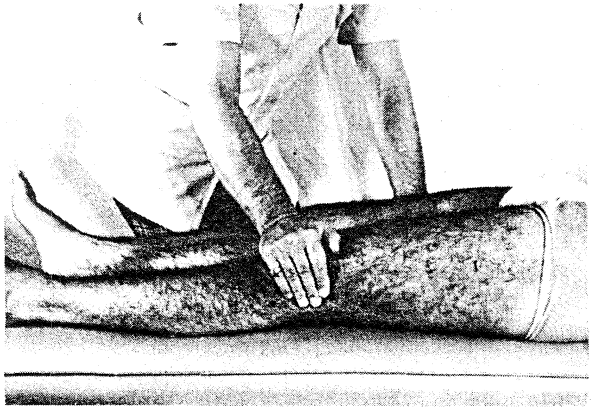


Figure 59 B

FOUCHET'S: Sign

With the patient supine and the knee in full extension, the examiner with the flat hand compresses the patella against the femur (Fig. 59a); if this produces point tenderness and pain at the patellar margin the sign is present.
If no pain is produced by the above, the patella under pressure is then rubbed transversly against the femur (Fig. 59b); grating, audible or palpable, and pain confirm the presence of the sign. When the patella has peripheral tenderness upon medial — lateral displacement: Perkins Test/Sign.
Significance: Chondromalacia Patellae

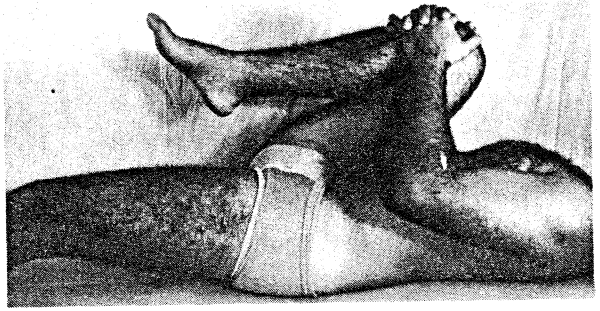
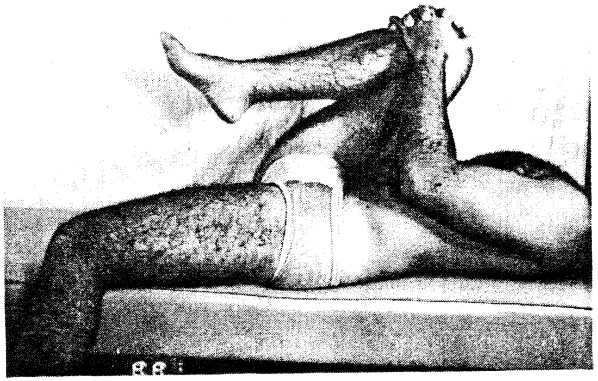


Figure 60 A

Figure 60 B



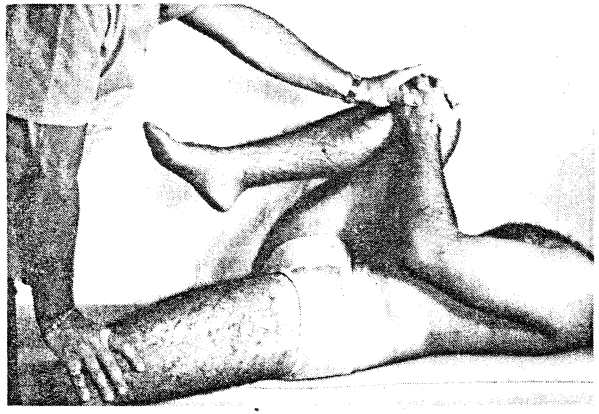


Figure 60C

GAENSLEN'S: Test

Procedure: The patient is supine, the affected side lying close to the edge of the table, the hip and knee of the non-affected side (if the lower trunk pain is unilateral) are flexed. The patient is directed to clasp his hands around the flexed knee and hold it to his chest (Fig. 60a). The patient is then brought toward the side of the table and the opposite lower limb is extended over the table edge at the hip (Fig. 60b). The examiner then applies downward pressure against the clasped knee and against the knee of the extended hip (Fig. 60c). Exacerbation of pain from the pelvis consititues a positive test.

Significance: The test is specific of a Sacroiliac joint lesion.

Note: The Gaenslen test is to sacroiliac disease what the Babinski sign is to corticospinal tract disease, but its validity is compromised with the presence of a hip or knee lesion, or adhesions of the upper lumbar nerve roots. Classically the hyperextension movement brings out the sacroiliac symptomatology, however, with the tremendous torsion stress that is put into the pelvis through the sacroiliac joints, if there is any significant lesion on either side, this maneuver will bring it out, especially in cases of wide, general, bilateral pain.

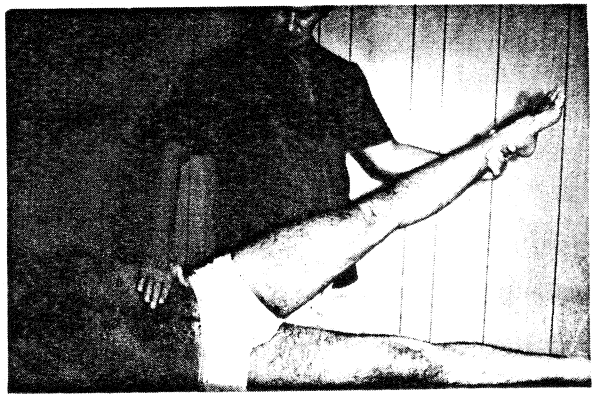


Figure 61 A

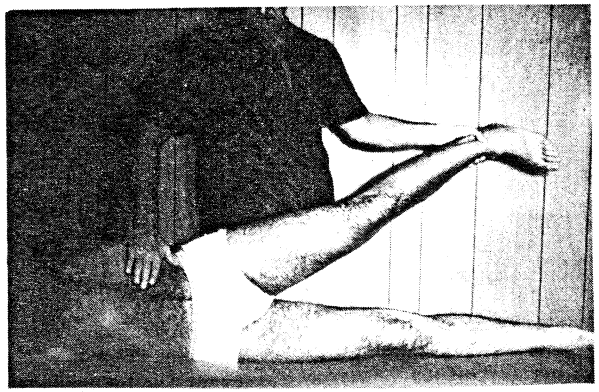


Figure 61 B

GAUVAIN'S: Sign

Procedure: With the patient in the side position, the affected hip is uppermost and extended. The lower leg of the affected side is grasped by one hand of the examiner while the palm of the other is placed on the patient's abdomen over the rectus and obliquus muscles (Fig. 61a). The limb is then rotated internally and externally (Fig. 61b). When the sign is present this maneuver provokes a peculiar type of reflex spasm with tightening of the abdominal musculature.

Significance: The sign is commonly present in Tuberculosis of the hip.

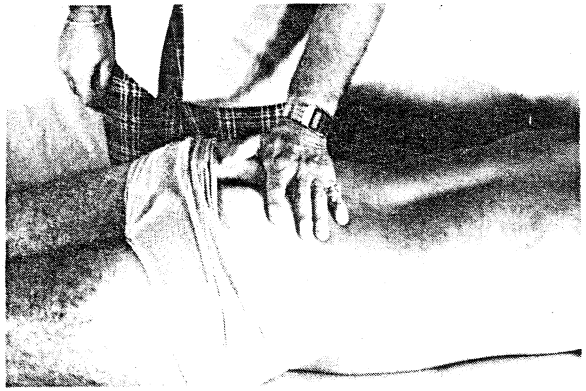


Figure 62 A

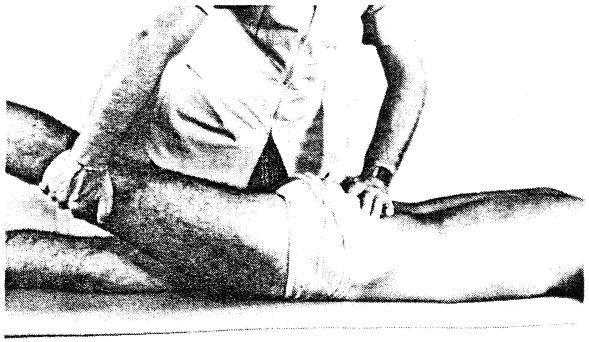


Figure 62 B

GILLIS': Test

Procedure: With the patient prone, the examiner places the base of the palm of one hand over the sacroiliac joint of the unaffected side to fix the sacrum with the fingertips fanning over the affected sacroiliac joint (Fig. 62a). The examiner's free hand is placed under the thigh of the affected side and the hip joint is levered into extension (Fig. 62b). The test is positive if the pain of the main complaint is aggravated over the affected sacroiliac joint.

Significance: Sacroiliac joint disease

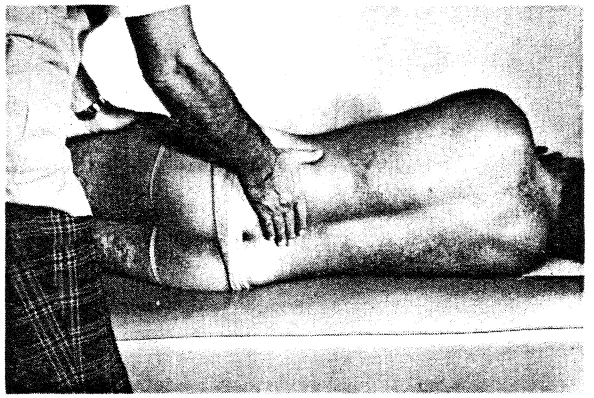


Figure 63 A

Figure 63 B

Figure 63 C

GOLDTHWAIT'S: Sign/Test

Procedure: The patient lies supine with both legs on the examining table. The examiner, on the side of involvement, places one hand under the patient palpating the lumbosacral joint and with the other hand performs straight leg raising of the affected side slowly (Figs. 63a & b). Normally it should be possible to raise this limb to a right angle with the examining table before any discomfort, muscle spasm or shifting of the pelvis occurs. As the hamstrings tighten, leverage is gradually applied to the side of the pelvis.

Significance: A differentiation of sacroiliac from lumbosacral involvement. If pain is brought on before the lumbosacral joint is opened, a lesion of the sacroilac joint or ligaments is presumed; if pain does not come on until lumbosacral movement occurs, the involvement is more likely to be lumbosacral.

Note: The test should be repeated on the other leg. If the lesion is lumbosacral, pain is felt when either leg is raised to **approximately the same height;** if the lesion is primarily sacroiliac, it is possible to raise the leg on the unaffected side to a greater level without pain (Fig. 63c) than the opposite, affected limb (Fig. 63b), such a maneuver is called the SMITH-PETERSEN Test.

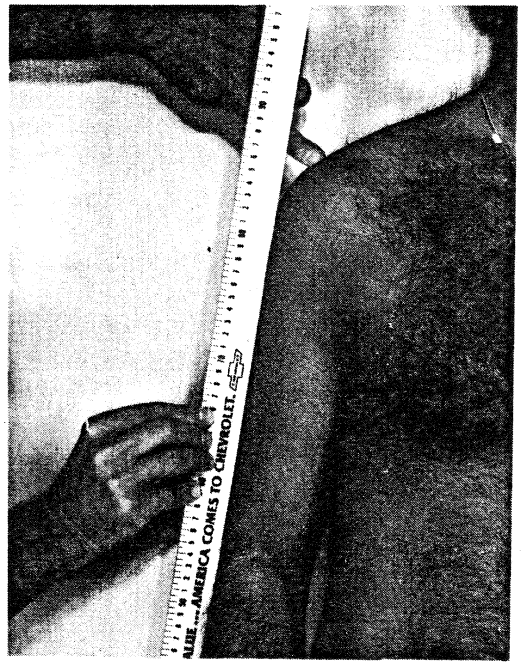


Figure 64

HAMILTON'S RULER: Test

If the test is positive, a straight edge (ruler or yardstick) can rest simultaneously on the acromial tip and the lateral epicondyle of the elbow (Fig. 64).

Significance: Dislocation of the shoulder

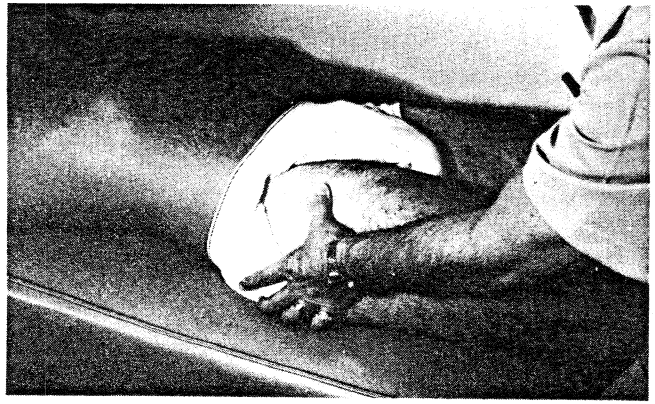


Figure 65

HENNEQUIN'S: Sign

The sign is present when, after lower limb trauma, digital compression below Poupart's (inguinal) ligament, lateral to the major vessels (Fig. 65), elicits pain, tenderness and crepitation.

Significance: Fracture of the neck of the femur

Figure 66 A

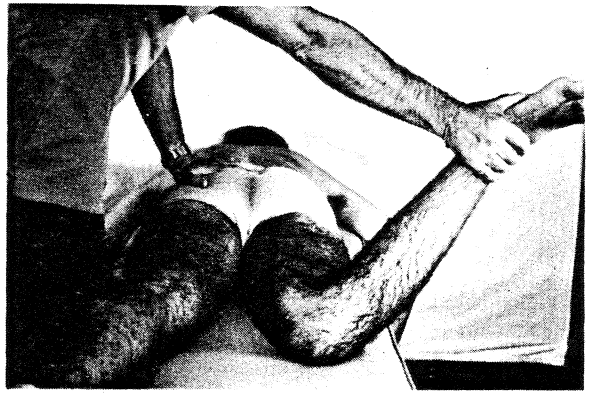


Figure 66 B

HIBB'S: Test

Procedure: With the patient prone, the examiner stabilizes the pelvis on the side nearest to him by placing one hand firmly on the dorsum of the iliac bone; with the other hand around the patient's ankle he flexes the opposite knee to a right angle (Fig. 66a). From this position the examiner slowly pushes the leg laterally causing strong internal rotation of the femoral head (Fig. 66b). The test is done bilaterally and the production of pelvic pain reveals a positive test.

Significance: A sacroiliac lesion; in the absence of hip involvement, stress is transmitted through the hip joints into the sacroiliac mechanism producing pain.

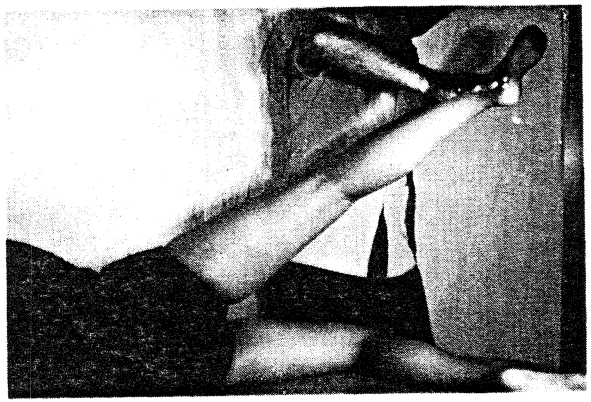


Figure 67

HIP ABDUCTION STRESS: Test

Procedure: The patient lying on the non-affected side actively abducts the contralateral (affected) lower limb at the hip and holds it in abduction, resisting downward pressure on it from the examiner (Fig. 67).

Significance: In even the mildest sacroiliac lesion, pelvic pain is brought out by this maneuver even though considerable hip integrity may be lost.

Figure 68

HOFFA'S: Sign

With the patient prone, ankles hanging well over the edge of the examining table in a symmetrical position, the sign is present when the examiner by movement and palpation finds the Achillis Tendon on the injured side less taut than on the contralateral side; also there may be increased dorsiflexion in the relaxed position on the affected side (Fig. 68).

Note: A loose fragment may be seen and felt behind either malleolus.

Significance: Avulsion fracture of the calcaneus

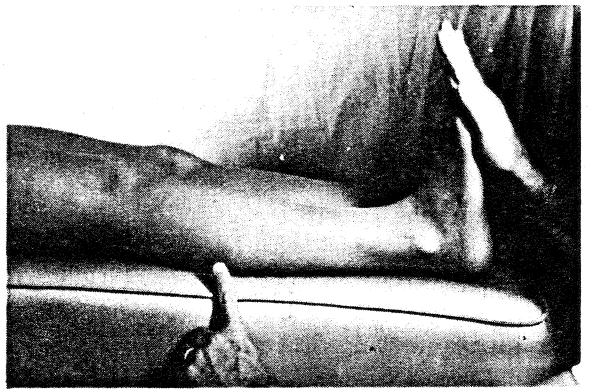


Figure 69

HOMAN'S: Sign

With the patient supine, and the knee extended, the examiner enforces dorsiflexion of the ankle (Fig. 69). The sign is present when such a maneuver elicits fairly well localized deep pain either in back of the calf or behind the knee.

Significance: Thrombophlebitis (thrombosis of the deep veins of the leg)

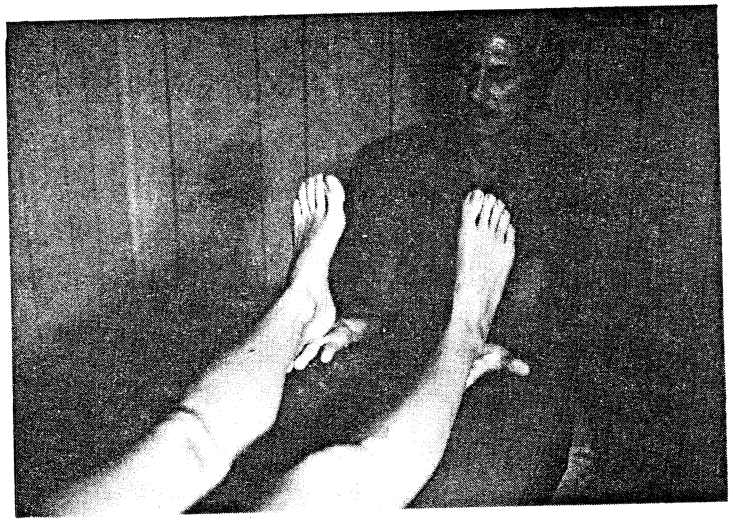


Figure 70

HOOVER'S: Sign

In alleged unilateral lower limb paralysis, the patient in the supine position is asked to raise the paretic leg; normally the patient involuntarily makes counterpressure downward toward the table with the heel of the opposite (non-affected) leg. The examiner can feel this counterpressure by placing his hands under both heels (Fig. 70). The sign is present if counterpressure is absent on the healthy side.

Significance: Evidence of malingering or hysteria, if the affected limb is truly weak or paralyzed, the downward pressure is accentuated on the healthy side as the patient attempts to raise the weak limb.

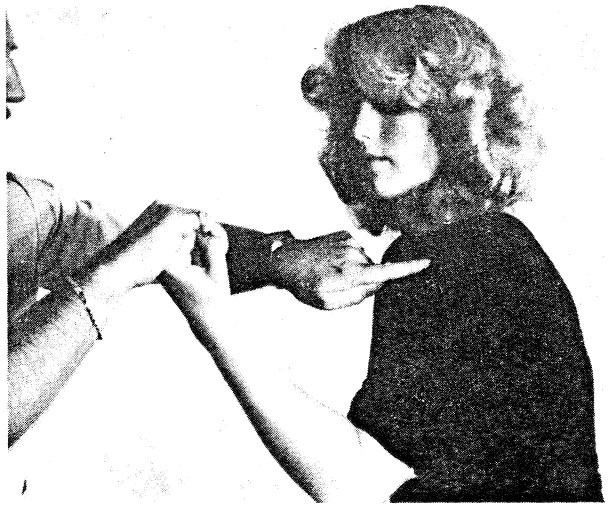


Figure 71

HUETER'S: Sign

The sign is present when there is pain in the shoulder as the supinated forearm is flexed against resistance (Fig. 71).

Significance: Partial rupture of the biceps

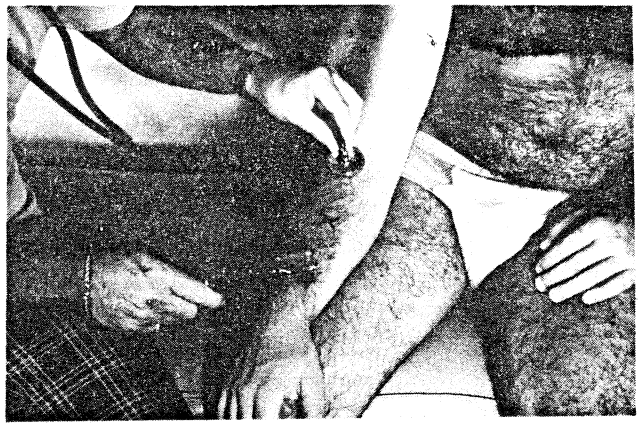


Figure 72 A

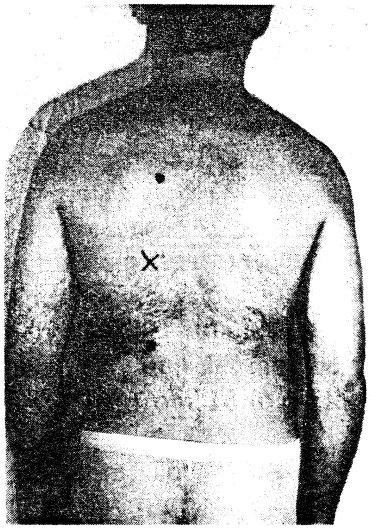


Figure 72 B

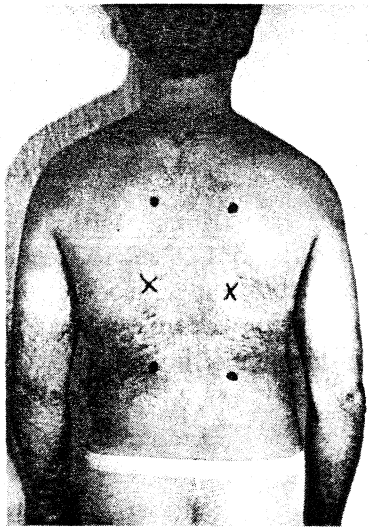


Figure 72 C

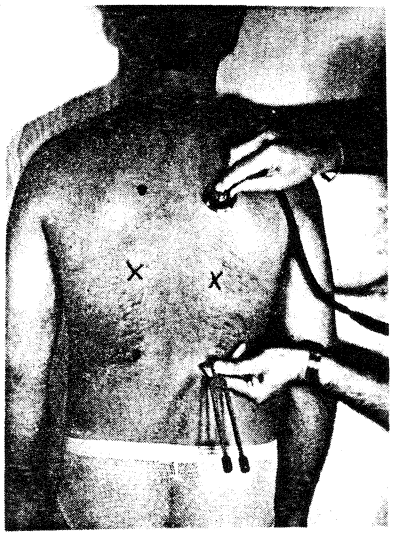


Figure 72 D

HUETER'S FRACTURE: Sign

Procedure: The examiner locates the fracture line in a long bone, then with a stethoscope placed on the bone an inch or more proximal to the lesion, he listens to see if osseous

vibration is transmitted across the fracture site either by a tuning fork (512 cycle) or tapping with a percussion hammer distal to the lesion (Fig. 72a).

Ordinarily sound can be heard a great distance over a long bone, practically from end to end. The sign is present when the vibration is not transmitted across the fracture site. The examiner should also check transmission from the same areas contralaterally to determine what is normal for that particular area.

Significance: An evaluation of fracture healing, the sign indicates soft tissue interposition.

Author's Note: This phenomenon of auscultating vibratory sounds, sometimes over considerable distances, through tissue has significant application in differentiating types of lesions, especially in distinguishing between a fairly localized semisolid lesion, e.g. cystic, inflammatory, etc. from a lesion of increased tissue density, e.g. spasm, hard tumor, etc. I have found the following procedure to work extremely well when localized areas, especially of the spine, show symptomatology of pain or discomfort.

Procedure: The centrum of the area of irritation is marked and two points, well outside the perimeters of involvement, one cephalad and the other caudad, are also indicated by a mark (Fig. 72b). These points should be as far apart as possible without any intervening bony prominence. Next, all three marks are reduplicated symmetrically on the non-affected side. (Fig. 72c). The examiner then on the non-affected side, with the stethoscope over the proximal point and a 512 cycle tuning fork placed on the distal point, auscultates the sonic vibrations through the tissue (Fig. 72d) in order to determine the caliber of the vibratory sounds through the normal tissue. The procedure is then repeated on the affected side.

Significance: If the lesion is semisolid, e.g. inflammatory, cystic, etc., the vibratory sounds will be less distinct, duller and less intense than normal; if the lesion is more compact than the normal tissue, e.g. spasm, hard tumor, etc., the sounds will be sharper, more distinct and intense than on the opposite, non-affected side.

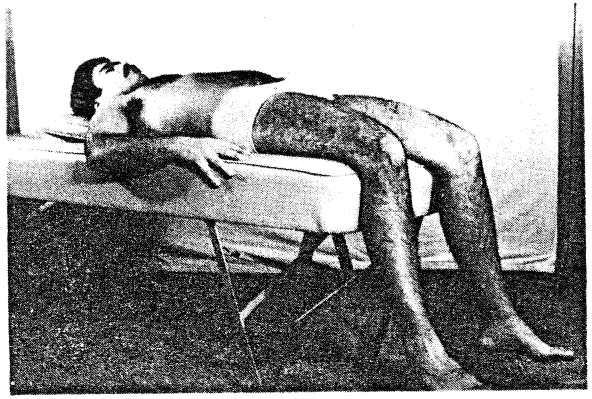


Figure 73 A

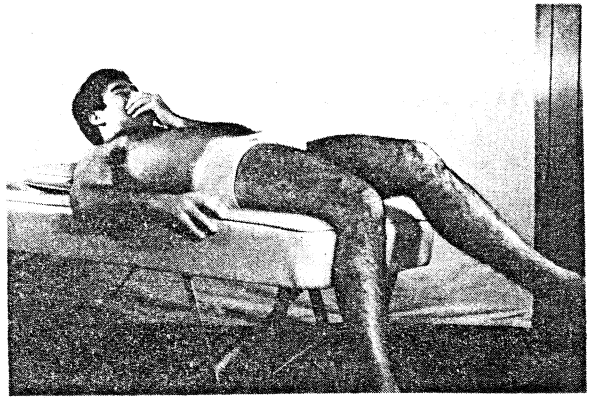


Figure 73 B

HUNTINGTON'S: Sign

The patient with lower limb paralysis or paresis is recumbent,

with the legs hanging over the edge of a table (Fig. 73a) and is told to cough hard. If the coughing produces flexion of the thigh and extension of the knee (Fig. 73b) in the affected limb the sign is present.

Significance: Paralysis due to an upper motor neuron lesion (see **ILLUSTRATED MANUAL OF NEUROLOGICAL REFLEXES, SIGNS AND TESTS)**

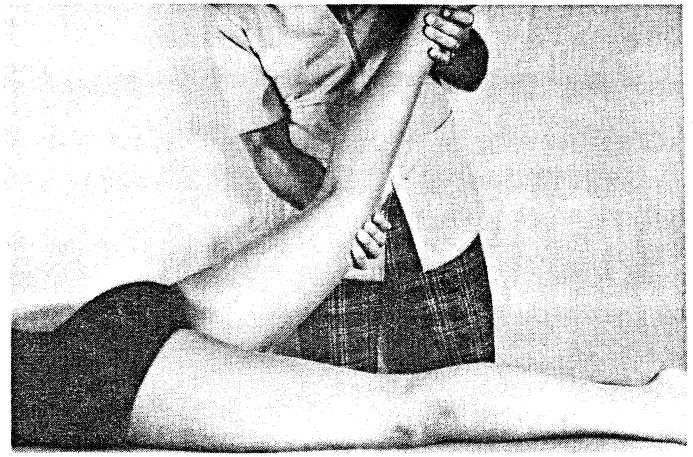


Figure 74 A

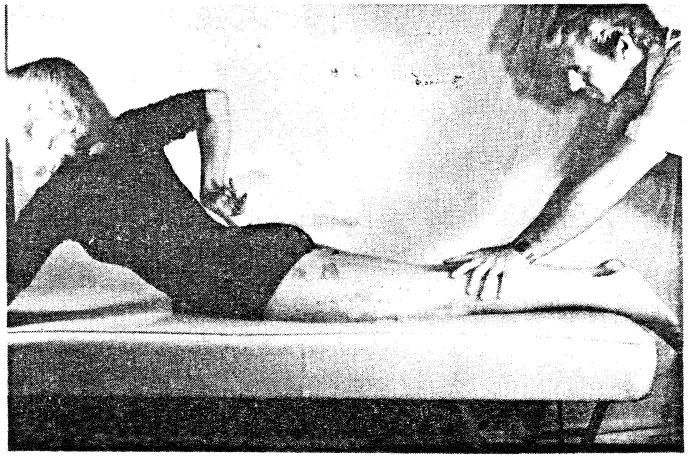


Figure 74 B

HYPEREXTENSION: Tests

1. Hip: With the patient lying face downward, the examiner from the non-affected side places one hand over the dorsum of the iliac bone of the opposite, affected side giving downward pressure and stabilizing the pelvis; with the free hand and on the involved side, the examiner slowly extends the hip with the knee in slight flexion (Fig. 74a). The test is only significant and positive if the patient from this action experiences pain radiating down the front of the thigh.

Significance: Adhesions and/or inflammation of the third and fourth lumbar nerve roots.

2. Low back: With the patient lying prone, arms at the sides and lower limbs straight and together, the examiner anchors the patient's lower limbs and directs the patient to lift the head, neck, and shoulders as high as possible from the table (Fig. 74b). The patient then points to the centrum of the pain elicited by this action.

Significance: Aids in localizing low back lesions

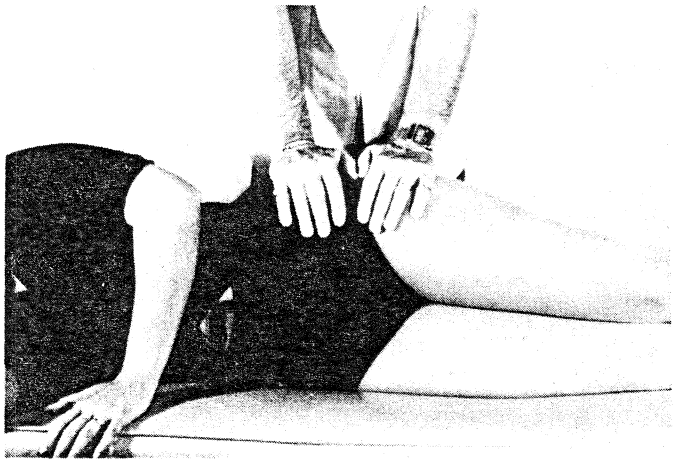


Figure 75

ILIAC COMPRESSION: Test

Procedure: With the patient lying on the side on a well padded table, the examiner with both hands over the superior innominate bone gives strong downward pressure (Fig. 75). When this maneuver elicits pain from the pelvis, the test is positive.

Significance: A Sacroiliac lesion

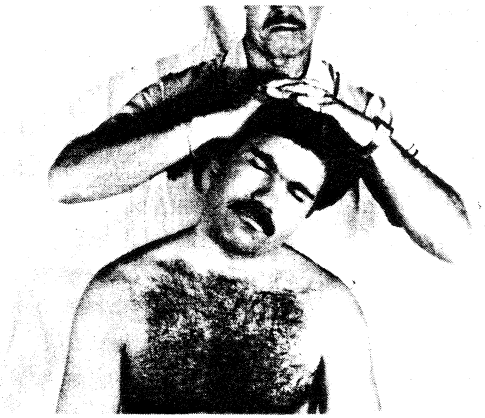


Figure 76

JACKSON COMPRESSION: Test

Procedure: The patient is sitting upright with the examiner standing behind. The patient is directed to laterally flex the neck and head in an attempt and without undue discomfort to approximate the ear on the affected side to the shoulder. The examiner then clasps his hands over the patient's head and exerts downward pressure (Fig. 76). An exacerbation of cervical **and/or** radicular pain indicates a positive test.

Significance: Nerve root compression

Figure 77 A

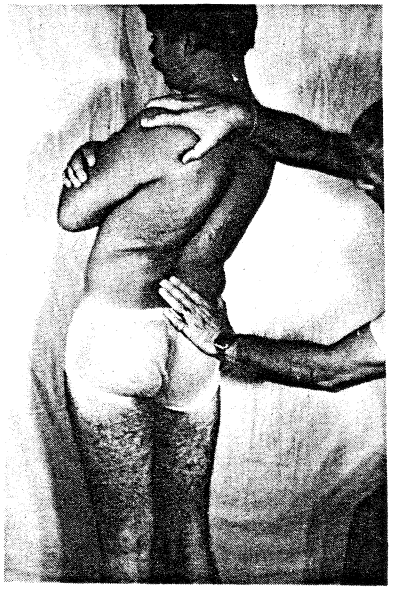
Figure 77 B

KAPLAN'S: Sign

With the patient seated, the affected upper limb is held straight out, the wrist is in slight dorsiflexion and grip strength is tested in the normal manner (Fig. 77a). This maneuver is then exactly repeated, this time with the examiner firmly encircling the patient's forearm with both hands placed approximately one to two inches below the elbow joint line (Fig. 77b). The sign is present when initial grip weakness and lateral elbow pain shows a significant increase in grip strength and a marked lessening of pain by constricting the musculature of the upper forearm.

Significance: Lateral Extra-articular Epicondylitis of the Elbow

Figure 78 A



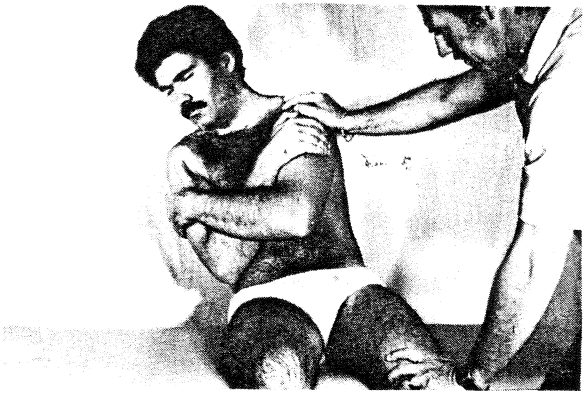


Figure 78 B

KEMP'S: Test

Procedure: The test is performed with the patient either

standing or sitting. In the former position the examiner, standing behind the patient, with one hand anchors the pelvis and sacrum and with the other he grasps the opposite shoulder; holding the pelvis, the shoulder is firmly forced obliquely backward, downward and medialward (Fig. 78a). In the latter position the examiner stands in front of the patient who is sitting with arms folded across the body and legs dangling over the examining table. With one hand stabilizing the pelvis by firmly pressing down on the thigh, the examiner with the other hand pushes the homolateral shoulder obliquely backwards (Fig. 78b) putting the lower spine on the opposite side in a combined position of rotation, lateral bending and extension as was also the objective in the standing position. Low back pain radiating into the lower extremity indicates a positive test but may have different interpretations.

Significance: In disk protrusion or prolapse the disk nuclear material may lie in a medial, lateral or inferior position relative to the nerve root. In disk material **medial** to the nerve root, the patient will lean into the side of the disk compression and the Kemp Test will be primarily positive when leaning **away** from the side of lower extremity dermatogenous pain and mildly positive when leaning into the side of pain. In disk material **lateral** to the nerve root, the relief position of the patient will be **away** from the side of pain and the test will be positive when leaning **into** the side of the pain and negative when leaning away. In an inferiorly placed disk, the patient resists bending to either side and prefers to stay in a strict flexed attitude of the lumbar spine. Note: Local pain in the low back does not constitute a positive Kemp's Test, but rather is indicative of a strain or sprain of the posterior articular facets and their pericapsular tissue. The pain into the lower extremity will be that of a pattern of dermatogenous radiation relative to the involved nerve root being compressed by discal protrusion or prolapse when the test is positive.

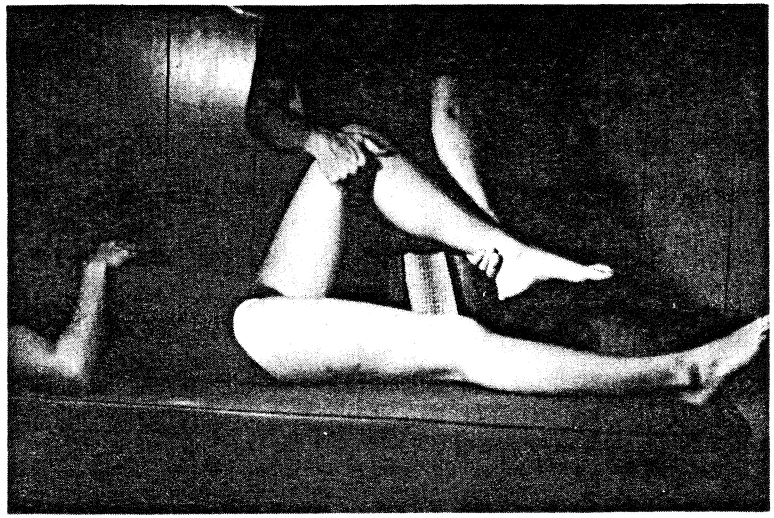


Figure 79 A

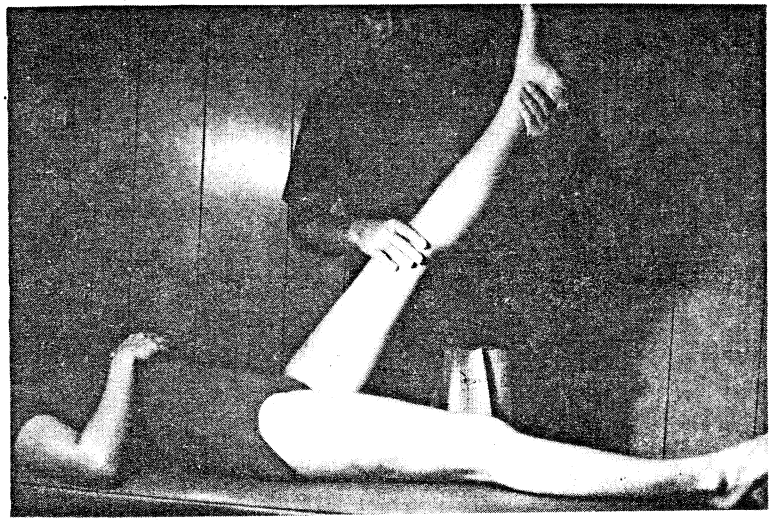


Figure 79 B

KERNIG'S: Sign

With the patient supine, the examiner passively flexes the thigh upon the pelvis to a right angle (Fig. 79a), then an attempt is made to completely extend the leg (Fig. 79b).

When pain prevents the complete performance of this maneuver on the side of involvement the sign is present.

Significance: This is the most reliable and constant sign of meningeal irritation. The sign is also present in certain radiculopathies.

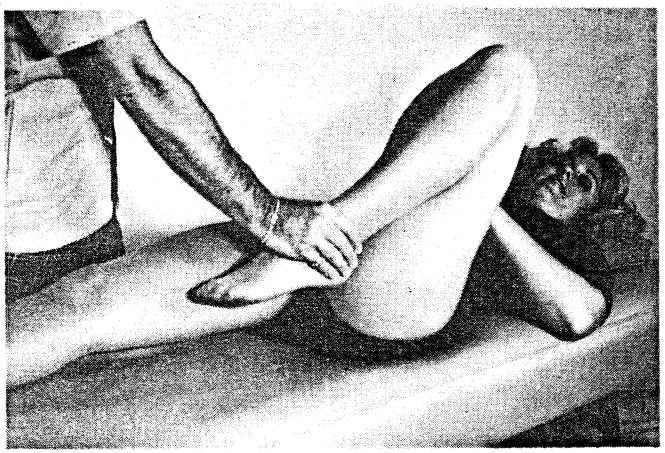


Figure 80

KNEE FLEXION STRESS: Test

Procedure: The patient is supine, the examiner raises the suspected knee with one hand while grasping the ankle with the other. As the knee goes into flexion, the examiner places his proximal hand over the knee and gently pushes it it to the patient's chest while the distal hand slowly brings the patient's heel into the ipsilateral buttock putting the knee into maximum flexion (Fig. 80). Normally the knee can be flexed until the heel touches the buttock with no sensation of pain. The test is positive when the maneuver cannot be performed because of pain or discomfort.

Significance: This test will identify even a trivial amount of knee flexion limitation signifying a lesion. Many times this

action will elicit and localize pain when no other procedure will.

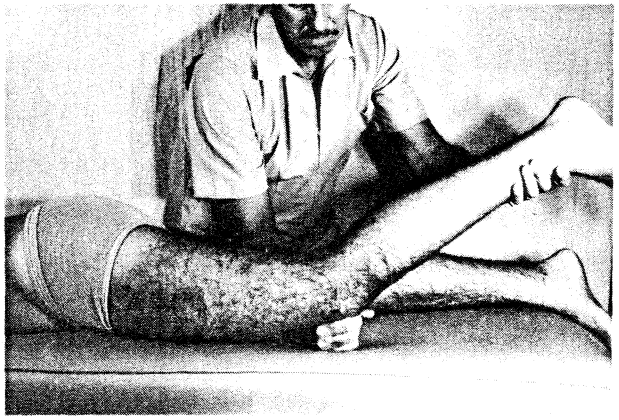


Figure 81 A

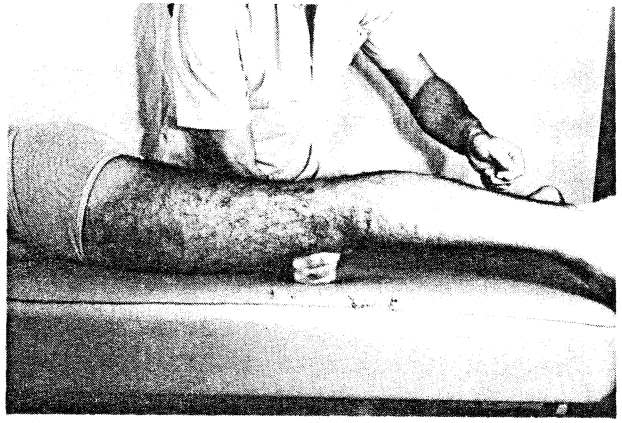


Figure 81 B

KNEE DROP: Test

Procedure: The patient is prone, the examiner cups his hand under the suspected knee and lifts it slightly from the table with the other hand partly flexing the knee (Fig. 81); then, when the muscles are fully relaxed, the knee is allowed to

drop into extension by its own weight (Fig. 81b). If there is any extension limitation, there is not the same "clean" feeling and not the same rebound action of the knee going into and coming out of extension as with the opposite normal knee.

Significance: Most lesions of the knee cause some extension limitation, this test determines even the slightest amount and has localizing value.

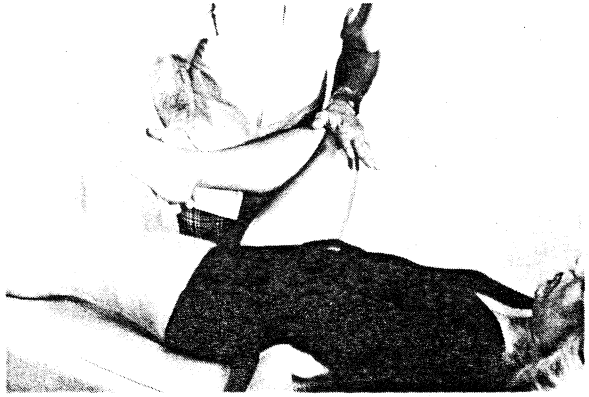


Figure 82

LAGUERRE'S: Sign/Test

Procedure: With the patient lying supine, the thigh and knee are flexed to right angles; the thigh is then abducted and rotated outward much like the Patrick Test except for the heel not approximating the opposite knee (Fig. 82). The head of the femur is forced against the anterior portion of the hip joint capsule by this action and when this produces pain the test is positive.

Significance: The negative value or what the test does not aggravate is important. Pain will be elicited in a homolateral

hip joint lesion, iliopsoas muscle spasm or a sacroiliac lesion but not in a lumbar or lumbosacral lesion.

Figure 83

LASEGUE: Test

Procedure: With the patient supine and the knee in extension, the examiner with one hand under the heel to lift and the other hand over the knee to prevent its flexion, slowly flexes the thigh on the pelvis to a right angle or ninety degrees (Fig. 83). The test is positive when the straight leg cannot be raised painlessly to this level because of aggravation of low back and sciatic pain. The angle of flexion at which pain occurs as well as the site and degree of pain are always recorded.

Significance: To many the test is of no particular diagnostic significance, to some it is of limited significant value and to a few it is one of the most important tests in differential diagnosis of low back radiculopathy. Almost all agree,

however, that the test of itself is at best, equivocal. When used in conjunction with other special orthopedic tests and signs, or when modified from the classical procedure it may be a valuable aid. For instance, if the test elicits sciatic neuralgia and foot dorsiflexion increases this pain, this is evidence of radiculopathy; if pain occurs at fifteen degrees of straight leg raising before the nerve roots are stretched, this is evidence of spasmophilia; if pain occurs at eighty degrees of flexion which is when the fifth lumbar nerve root is under maximum pull, this may indicate an L4-5 disk herniation. Thus the test by itself may signify a diversity of diagnoses. Indeed! even its name shows inconsistancies, the test described by Lasegue was that of hip flexion to ninety degrees followed by knee extension (The Kernig Test). The term 'Lasegue' now has clinical acceptance as being synonymous with straight leg raising.

Synonym: The Straight Leg Raising Test; The SLR Test

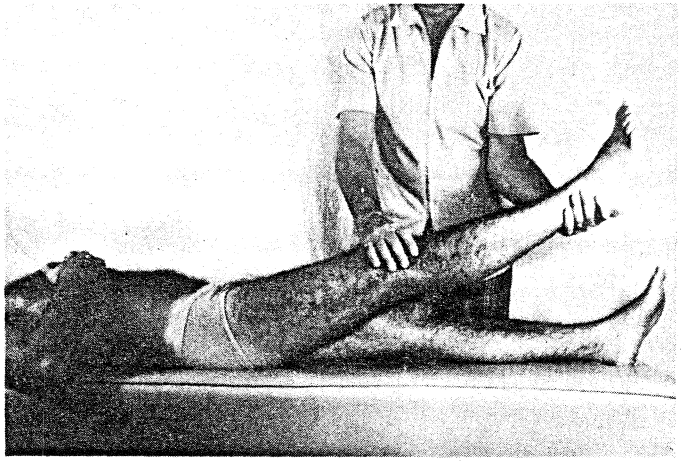


Figure 84 A

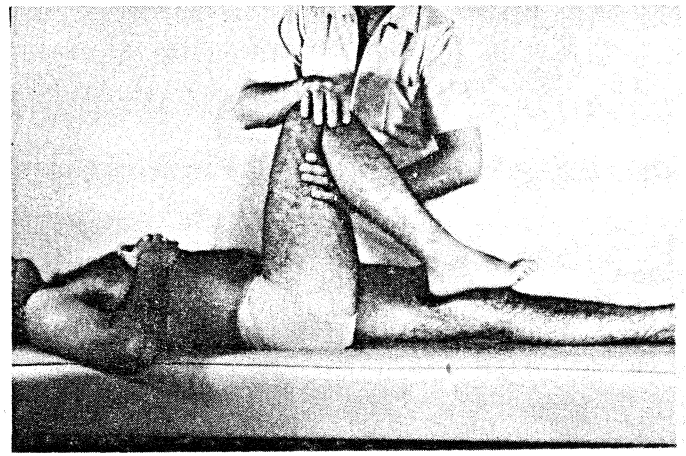


Figure 84 B

LASEGUE DIFFERENTIAL: Sign

If in a patient with sciatica, the examiner elicits pain on flexing the hip with the knee extended (Fig. 84a), but flexing the thigh on the pelvis with the knee flexed produces no sciatic pain (Fig. 84b), the sign is present.

Significance: Hip joint disease is ruled out

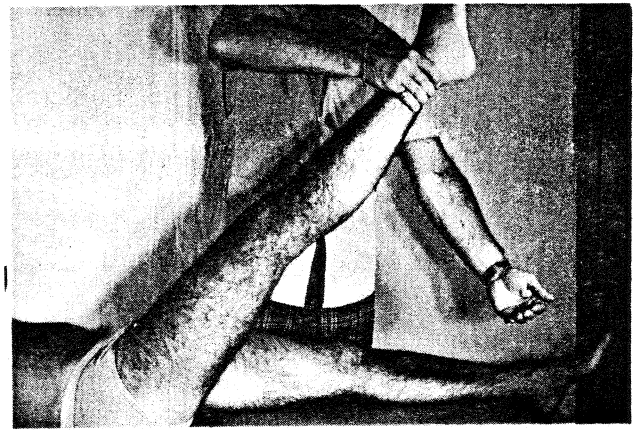


Figure 85 A

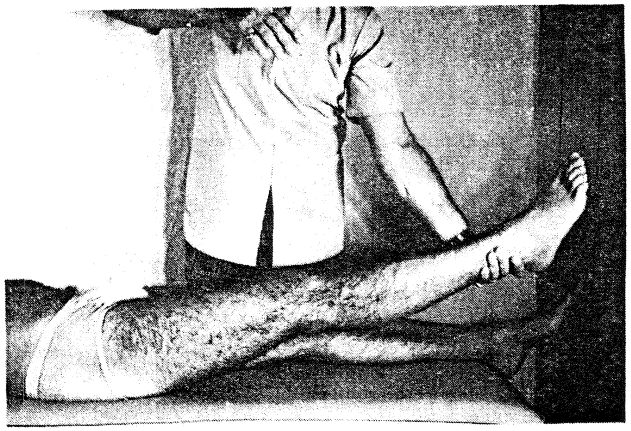


Figure 85 B

LASEGUE REBOUND: Test

Procedure: With the patient supine, arms at the sides and legs straight out, the examiner performs straight leg raising slowly on the side of the main complaint; at the point where the straight leg raising produces muscle resistance as recognized by the examiner, or pain as indicated by the patient (Fig. 85a), the leg is suddenly dropped, without warning, into a pillow or the examiner's other hand (Figs. 85a & 85b). When this act aggravates backache and sciatic pain and increases low back muscle spasm, the test is positive.

Significance: The test is particularly diagnostic of Psoas spasm or irritation, and generally indicative of an intervertebral disk lesion above the lumbosacral level.

Synonyms: Lewin's Lasegue Test in Reverse; The Drop Lasegue Test

Figure 86

LASEGUE SITTING: Test

Procedure: The patient with legs dangling, is sitting upright on the edge of a table or chair which has no backrest. The examiner faces the patient and usually under the guise of "checking the circulation," or feeling the skin or "checking for flat foot," extends the patient's legs below the knee, one at a time, so that the lower limb from the hip to the foot is parallel with the floor (Fig. 86). In the absence of radiculoneuropathy the patient should notice no discomfort by this action.

Significance: Initially the same as The Lasegue Test, the modification of the straight leg raise in this sitting position, however, has several other advantages:

1. In the supine position straight leg raising may be difficult as the patient may squirm and shift the pelvis making the leg abduct and rotate.
2. The apprehensive patient may attempt to ward off anticipated pain and make the test positive sooner than

warranted.

3. In the sitting position the patient faces the examiner, feels more secure and at ease, is less likely to even know he is being tested under the various guises mentioned, and thus there was a disarming and distracting effect. The test is performed mostly with complete unawareness on the part of the patient in those suspected of simulating, falsifying or magnifying their symptoms.
4. The test has excellent objective value when the examiner is able to determine immediately the slightest attempt on the part of the patient to withdraw by leaning back from the induced pain.

Synonyms: Sitting Straight Leg Raising Test (see Bechterew's Sitting Test)

Figure 87

LEWIN-GAENSLEN'S: Test

This is a modification of the Gaenslen Test in which the patient lies on the side pulling the knee of that side to the chest and holding the upper thigh in extension for the examiner, who, standing behind the patient then gives pressure flexing one hip against the chest while extending the

other thigh (Fig. 87).

Significance: Sacroiliac lesion

Figure 88

LEWIN PUNCH: Test

Punching the buttock produces a referred pain in the back like a reversed Queckenstedt. In making this test positive, the buttock on the side of the lesion when punched in the standing position elicits the pain (Fig. 88), punching the opposite buttock does not.

Significance: A Spinal lesion, usually a protuded disk

Synonyms: The Punch Test; The Gluteal Punch Test

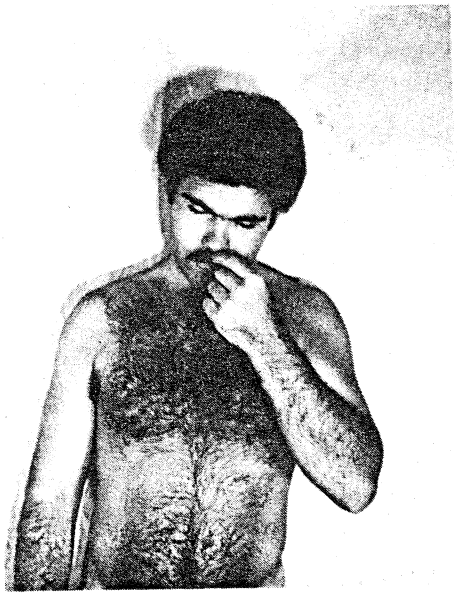


Figure 89

LEWIN SNUFF: Test

Procedure: The patient is given a pinch of snuff, mild pepper, etc. to sniff up the nostril. in order to induce sneezing (Fig. 89). The test is positive when sneezing elicits an exacerbation of well localized spinal and radicular pain.

Significance: Intervertebral Disk Rupture

Figure 90 A

Figure 90 B

LEWIN STANDING: Test

Procedure: The patient is standing on a short, firm stool, the examiner from behind stabilizes the pelvis with one hand while sharply pulling the knee on that side into extension (Fig. 90a). This is repeated on the opposite side followed by the examiner bracing his shoulder against the patient's sacrum and pulling both knees sharply into extension (Fig. 90b). A positive test reveals pain when the knee or knees are pulled into extension followed by either knee or both snapping back into flexion.

Significance: Unilateral or bilateral Hamstring spasm.

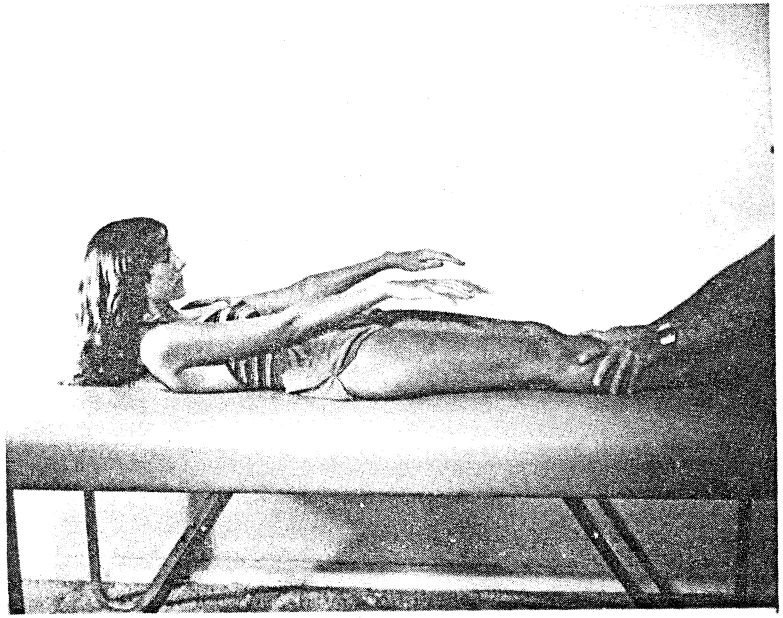


Figure 91

LEWIN SUPINE: Test

Procedure: The patient is supine, arms held straight out above the thighs, lower limbs together and parallel. The examiner stabilizes the lower trunk by either placing the arms transversely across the thighs or holding the ankles down (Fig. 91). The patient is asked to sit up. The test is positive when the patient cannot do so.

Significance: An ankylosing dorsolumbar spinal lesion

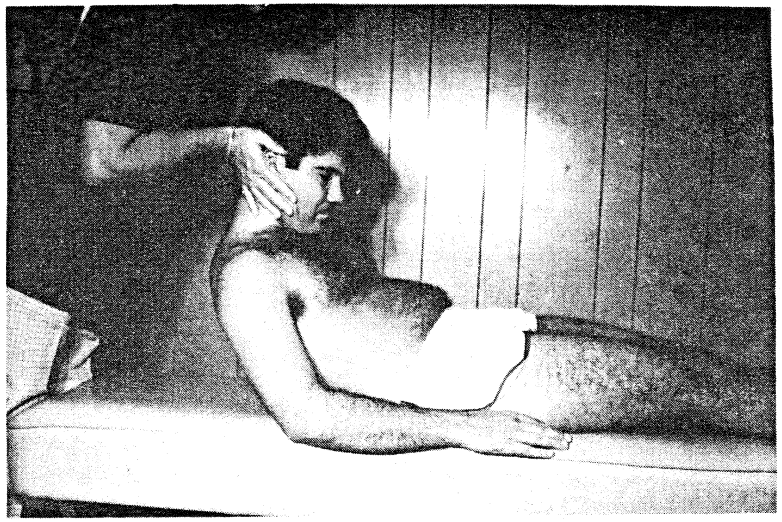


Figure 92

LINDNER'S: Sign

With the patient supine, the examiner standing behind the patient's head puts both hands in back of the occiput and enforces head, neck and dorsolumbar flexion, rounding the trunk into one large "C-shaped" curve (Fig. 92). The sign is present when it aggravates or reduplicates the **radicular** pain of the main complaint.

Significance: Low back nerve root compression

Figure 93 A

Figure 93 B

MAGNUSON'S: Test

Procedure: The patient with alleged low back pain is asked to point to the site of the pain and the examiner marks that site (Fig. 93a). The examiner then distracts the patient by performing any relevant examination away from the marked site of pain, then resuming the examination of the low back. The test is positive with any significant change of the site of the pain (Fig. 93b).

Significance: Evidence of simulated pain, hysteric or malingering

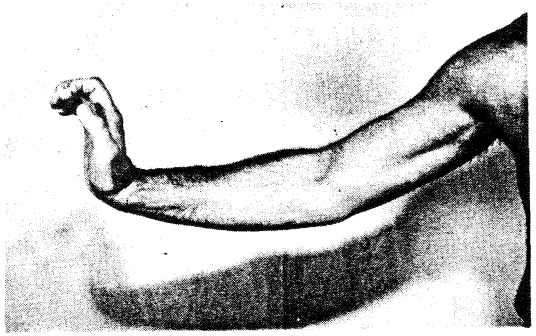


Figure 94

MAISONNEUVE'S: Sign

Marked hyperextensibility (Dorsiflexion) of the hand (Fig. 94).

Significance: A symptom of Colles' Fracture

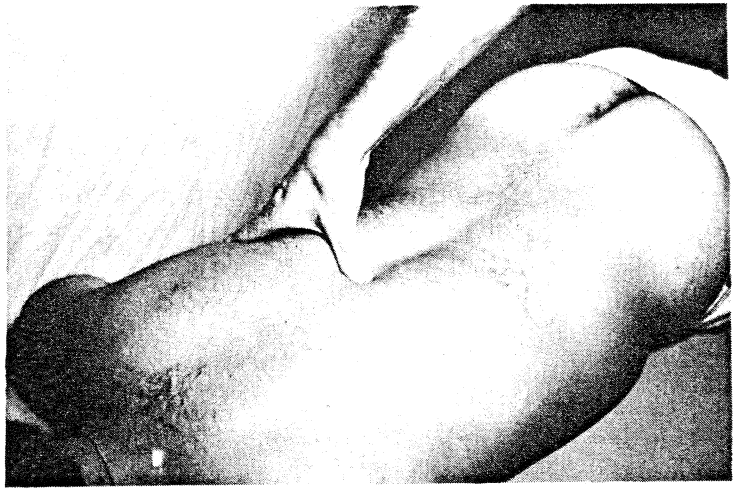


Figure 95 A

Figure 95 B

MANUAL PERCUSSION: Test

Procedure: The patient is in the prone position with the arms hanging over the sides of the table and the face downward. A firm pillow is placed under the patient propping up the area to be investigated. The examiner places the thumb of one hand over the spinous process and his hypothenar area of the other hand upon his thumb exerting downward pressure of up to fifteen pounds (Fig. 95a & b). The examiner manually percusses each spinous process within the spinal area of complaint and those just outside. The test is positive when the percussion aggravates and reduplicates the pain of the main complaint.

Significance: The test differentiates joint (sprain) from soft tissue (strain) involvement. When a vertebral joint has sustained a sprain, subluxation, luxation or fracture, the musculature of the joint will go into protective (antalgic) muscle spasm to limit motion. Attempts to antagonize this protective spasm are vigorously resisted by a subsequent increase in pain. Such percussion places stress into the joint but does not significantly stimulate or irritate paravertebral musculature. When the spinous process of the superior segment of the joint is so stressed by manual percussion, there will be a well localized reduplication of the pain about which the patient is complaining. If there is no specific joint involvement, percussion of one spinous process will elicit no significantly different response than any other.

Figure 96 A

Figure 96 B

MAXIMUM CERVICAL COMPRESSION: Test

Procedure: The patient, in a sitting position, is directed to actively bring the ear of the involved side as close to the ipsilateral shoulder as possible (Fig. 96a). From this posture the patient is further directed to bring the chin as close as possible to the same shoulder (Fig. 96b). Eliciting radicular pain on the side of the lateral flexion and rotation constitutes a positive test. The test may be repeated passively if there is no response from active motion.

Significance: Cervical nerve root compression, lateral flexion combined with the above described rotation will narrow the diameters of the intervertebral foramina as much as anatomically possible and any significant impingement upon the nerve roots will be revealed.

Figure 97 A

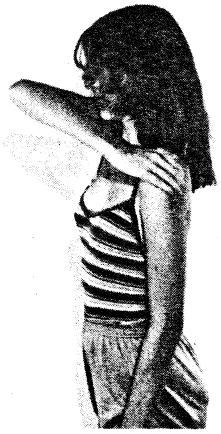


Figure 97 B

Figure 97 C

MAZION'S SHOULDER: Maneuver

Procedure: The patient while standing or sitting, places the palm of the affected upper limb over the tip of the opposite shoulder (Fig. 97a), and from this position proceeds to move the elbow of the affected side to and fro from the chest to the forehead (Figs. 97b & c) giving it an inferior-superior rocking motion. The maneuver is positive if this action produces or aggravates shoulder and/or arm pain on the homolateral side.

Significance: The pain of any significant shoulder pathology will be intensified and localized by this maneuver.

Synonym: The Shoulder Rock Test

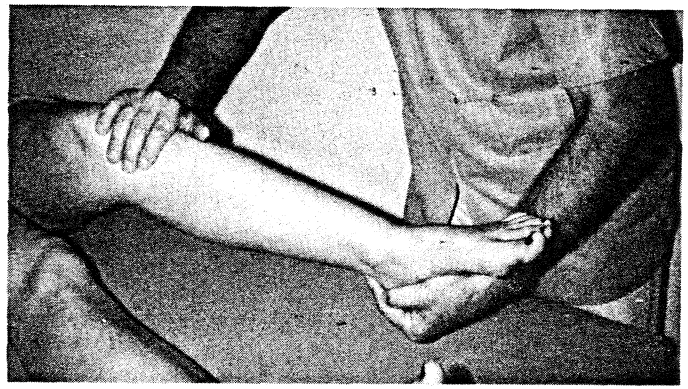


Figure 98 A

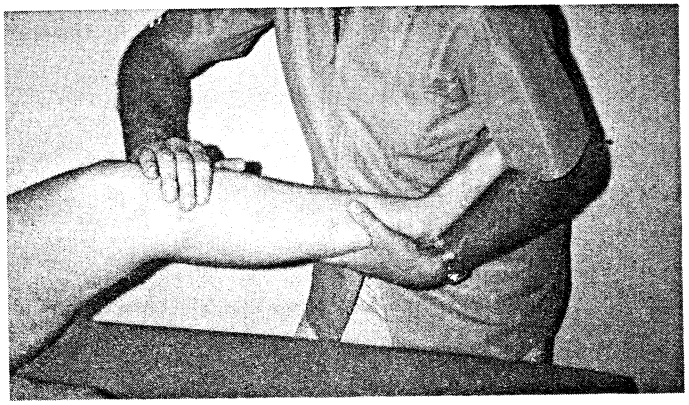


Figure 98 B

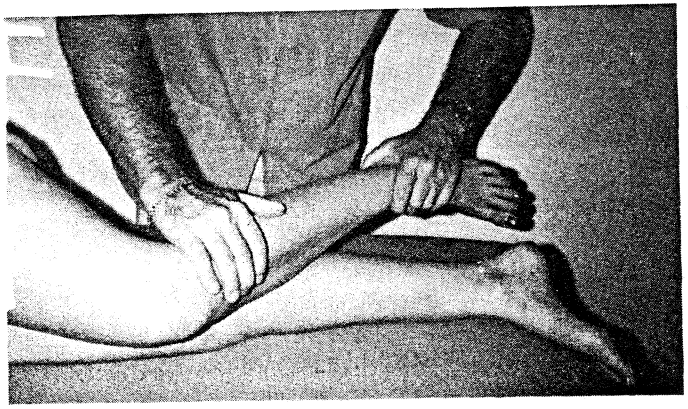


Figure 98 C

McINTOSH: Test

Procedure: The patient lies supine, the affected lower extremity being supported at the heel by one of the examiner's hands while the other is placed laterally over the proximal tibia just distal to the knee. The proximal hand of the examiner applies a valgus (abduction) stress and internally rotates the tibia as the knee is gradually moved from a position of full extension into flexion (Fig. 98a). When the test is positive there will be at approximately 30 to 40 degrees of flexion, a sudden jump and a palpable "clunk" is noted as the lateral tibial plateau which has subluxated

anteriorly within the first 5 to 15 degrees of flexion, suddenly reduces.

Significance: Antero-lateral rotary instability of the knee.

Note: The test is dependent upon an intact ilio-tibial band which becomes very taut at the point of reduction and glides posteriorly to the transverse axis of rotation and thus pulls the tibial plateau into reduction with a jumping sensation.

The McIntosh Test has many modifications, when performed with the examiner's hand and arm securing the distal leg (Fig. 98b), it is called the **D'Ambrosia Test;** when done with the patient lying in the side position (Fig. 98c) it is called the **Slocum** modification; when the order is reversed, e.g. flexion into extension, it is called the **Hughston Test.**

Synonym: Knee "Jerk Sign"

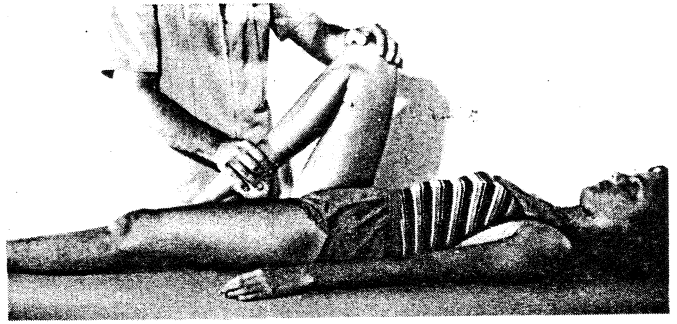


Figure 99 A

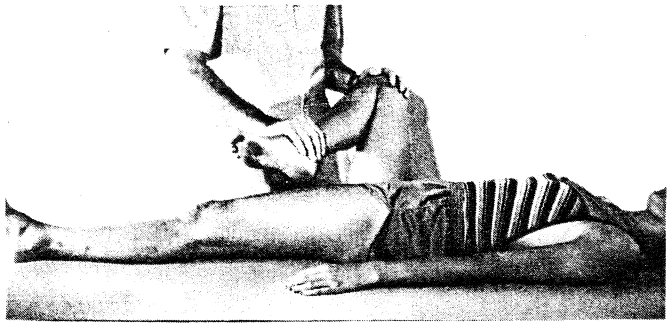


Figure 99 B

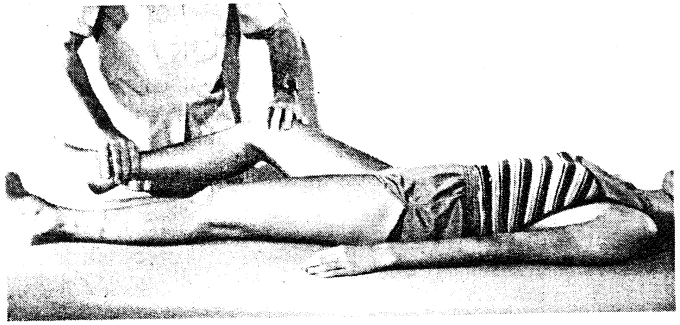


Figure 99 C

McMURRAY'S: Sign

Procedure: The patient is supine, the examiner stands on the side to be tested, with one hand over the patient's knee and the other grasping the foot, the examiner flexes the knee to a point where the heel approximates the ipsilateral buttock (Fig. 99a). With the examiner's index finger palpating the medial joint line and the thumb over the lateral joint line, the knee is pulled into abduction with the foot and leg into external rotation (Fig. 99b). The examiner then extends the knee slowly while holding it in strong abduction (Fig. 99c). A palpable and/or audible click with pain from the medial joint line reveals the sign is present. Further, it is essential that the knee be extended to the maximum during the test as most positive responses occur within the last thirty degrees of extension.

Significance: Medial meniscus displacement

Note: When internal rotation of the leg with adduction of the knee produces these findings on the lateral joint line, lateral meniscus displacement is suspected.

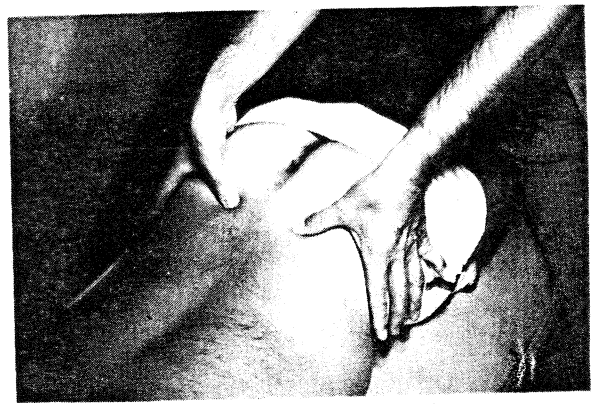


Figure 100 A

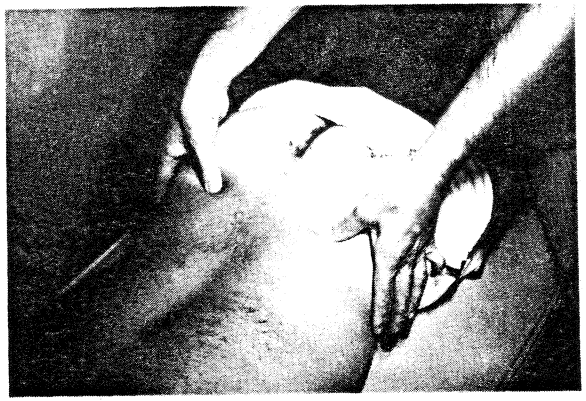


Figure 100 B

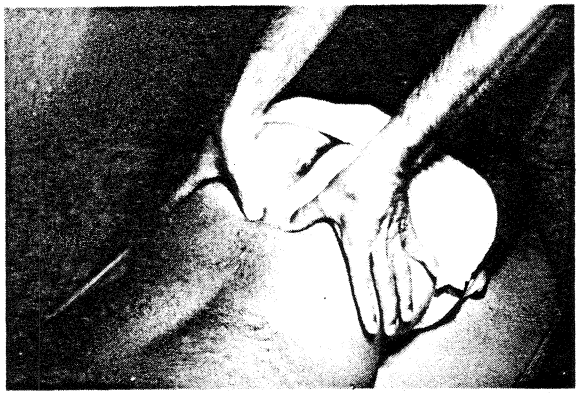


Figure 100 C

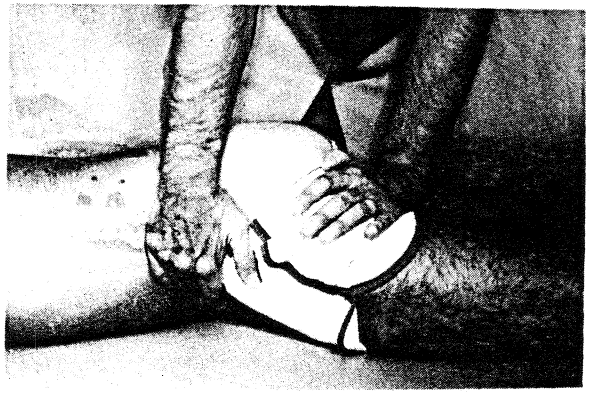


Figure 100 D

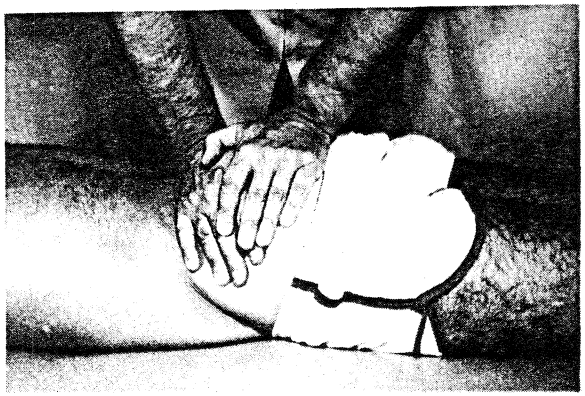


Figure 100 E

MENNELL'S: Test

This is a two stage test with the second part depending on the findings of the first.

Procedure: The examiner's thumbs are placed over the patient's posterior superior iliac spines (Fig. 100a); they are made to slide outward (Fig.100b) and inward (Fig.100c) as far as the superficial tissue laxity will allow. Tenderness upon pressure and/or the reduplication of the pain of the main complaint elicited at the inward or outward point constitutes a positive test.

In the second stage, the examiner does two things when pain is elicited at the inward point: 1. He pulls the pelvis backwards (Fig. 100d) and 2. He pressures the pelvis forward (Fig. 100e), both actions being done on the side (or sides) of tenderness. When the tenderness is increased by the backward pressure but decreased by the forward pressure, this substantiates and confirms the significance of the inward tenderness.

Significance: Outward point tenderness: sensitive deposits (myofascitis) of the gluteal aspect of the posterosuperior spine.

Inward point tenderness: Superior sacroiliac ligament strain due mostly to sprain or subluxation.

Figure 101 A

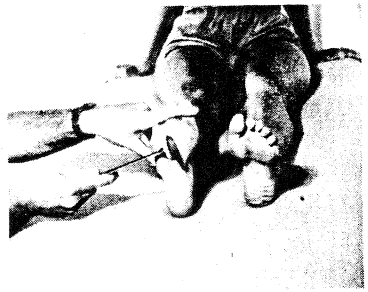


Figure 101 B

METATARSAL: Test

Procedure: The patient is seated, lower limbs straight out and the feet extending over the table. The examiner produces forced extension of the outer four toes so that the ball of the foot is made prominent (Fig. 101a). A reflex hammer is used to firmly percuss the protruding metatarsophalangeal joints of the outer four toes (Fig. 101b). The test is positive when such action elicits neuritic pain.

Significance: Anterior Metatarsalgia due to inflammation of the metatarsophalangeal joints.

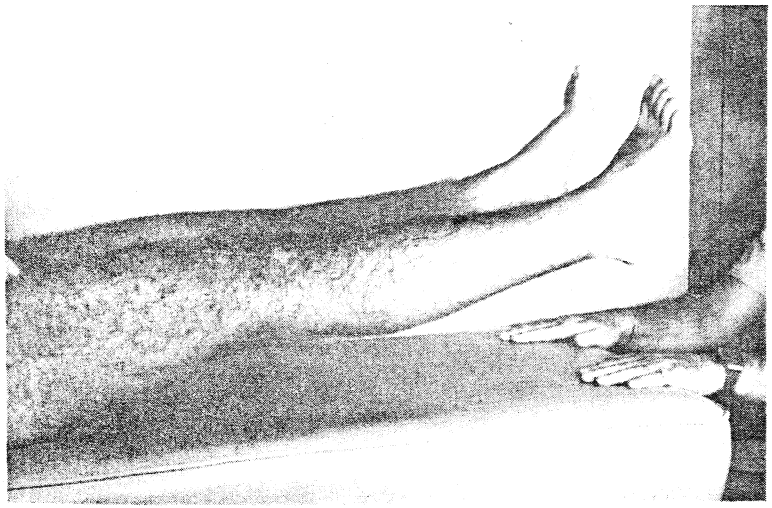


Figure 102

MILGRAM'S: Test

Procedure: The patient lies supine with both lower limbs straight out and is directed to raise them to a position where the heels are two or three inches from table (Fig. 102) for as long as he can. The test is positive if the patient experiences low back pain as the maneuver is attempted.

Significance: As this maneuver increases subarachnoid pressure, if the patient can hold the position for thirty seconds without pain, intrathecal pathology can be ruled out. If the test is positive there may be pathology within or outside the spinal cord sheath such as a herniated disk.

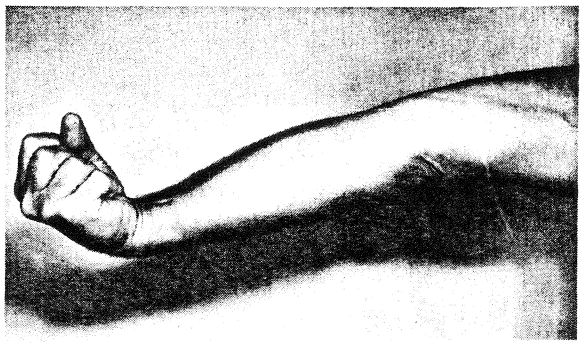


Figure 103 A

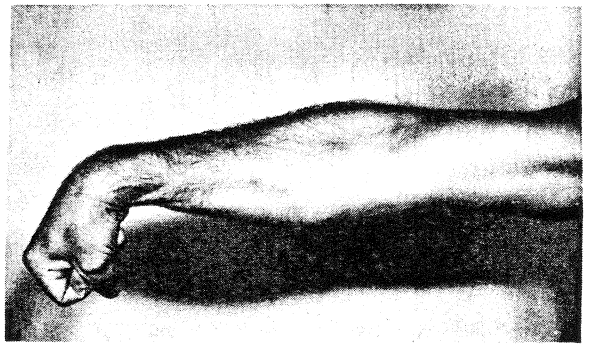


Figure 103 B

MILL'S: Test/Maneuver

Procedure: With the elbow in full extension, the wrist and fingers are fully flexed (Fig. 103a), the forearm is then maximally pronated (Fig. 103b). The test is positive if this maneuver causes sharp tenderness and pain of the lateral elbow joint.

Significance: Radiohumeral Epicondylitis (Tennis Elbow)

Note: Many authorities claim that Mill's test is the classic maneuver for the above as this action will aggravate only a true "Tennis Elbow" and no other lesion.

Figure 104 A

Figure 104 B

Figure 104 C

MINOR'S: Sign

A method of arising from a chair whereby the patient grasps both arms of the chair with his hands, leans forward, jackknifing the thighs and the dorsolumbar spine so that his head is over the feet. Thus bringing the elbows into acute flexion the patient then pushes himself to an upright position by straightening out the elbows and in this way spares lower limb effort (Fig. 104a). The patient may substitute his knees for chair arms and more or less climb up the thighs using the same aforementioned movements (Fig. 104b). Or the patient may also support himself on the healthy side, placing one hand on the back, bending the affected side and balancing on the healthy leg (Fig. 104c).

Significance: The sign is characteristic for patients with sciatica.

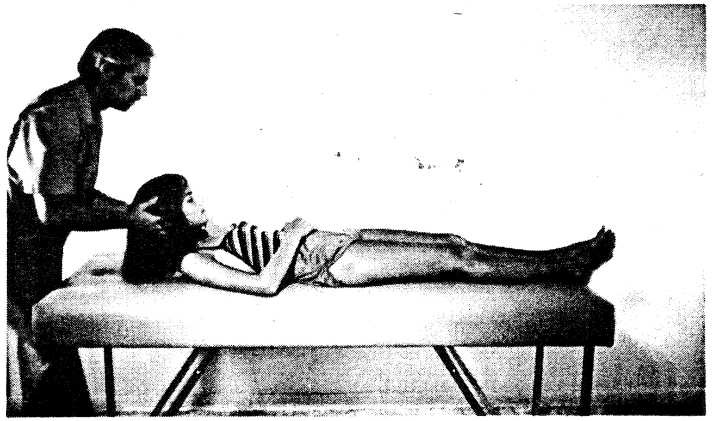


Figure 105 A

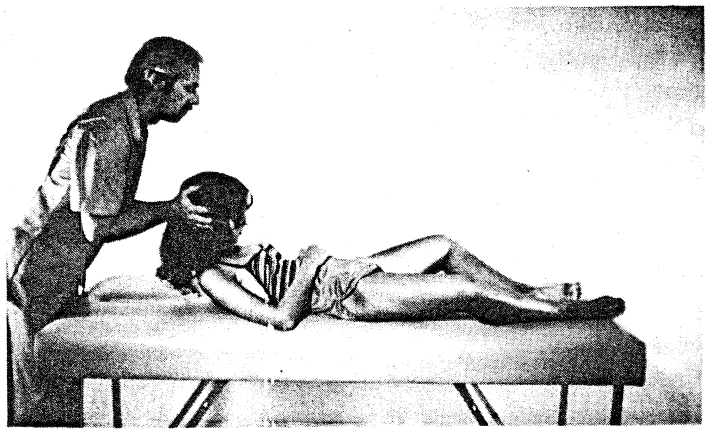


Figure 105 B

MORQUIO'S: Sign

With the patient lying supine, the lower limbs straight out and the examiner at the patient's head, all efforts to raise the patient to a sitting posture (Fig. 105a) are vigorously resisted by the patient. If the examiner, however, places the knees and hips into passive flexion, the trunk can be raised to a sitting position with little opposition (Fig. 105b).

Significance: Epidemic Poliomyelitis

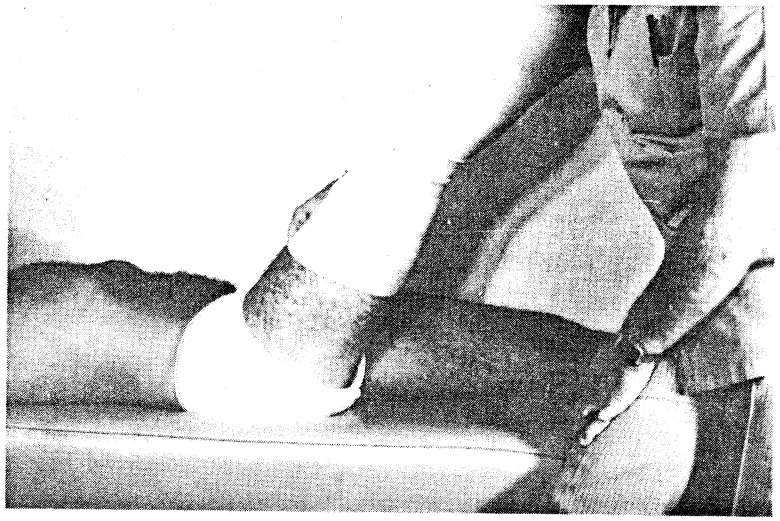


Figure 106 A

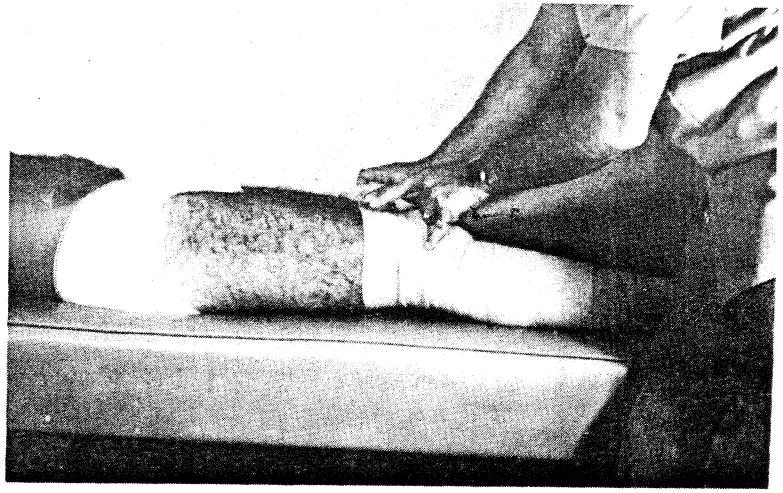


Figure 106 B

MOSKOWICZ: Test

Procedure: The patient's extremity, either upper or lower, is elevated, an elastic bandage is wrapped firmly around the limb (Fig. 106a) and the elevated position is maintained for five minutes. Then the extremity is placed in a horizontal position and the examiner quickly removes the applied bandage (Fig. 106b). If the circulation is normal, a hyperemic blush occurs promptly and rapidly flows into the area as the bandage is removed. The test is positive when the blush is either absent or slight and lags slowly behind the unbandaged area.

Significance: Inadequacy of collateral circulation as in an arteriovenous fistula.

Synonym: Hyperemia Test

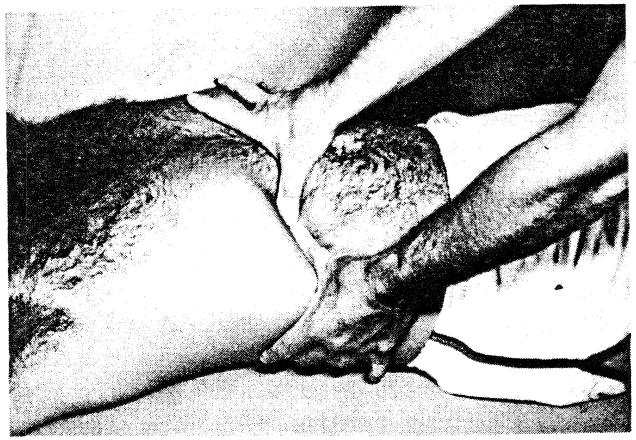


Figure 107

MURPHY'S: Test

Procedure: With the patient supine, the examiner places the pads of both thumbs just under the twelfth rib on the right side and on either side of the mid-clavicular line (Fig. 107). The patient is instructed to take a deep breath and slowly let it out completely. The examiner, synchronous with the patient's expiration, firmly gives downward pressure with the thumbs. The test is positive if the patient cannot fully expirate painlessly.

Significance: Biliary tract inflammation

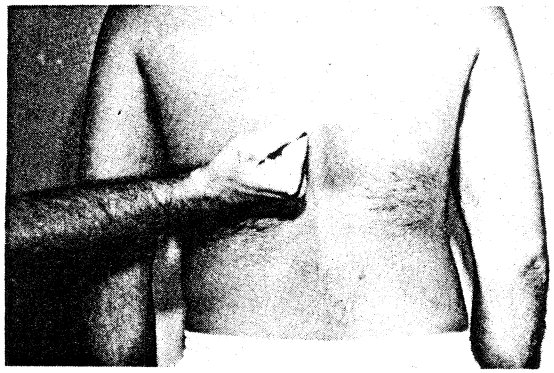


Figure 108 A

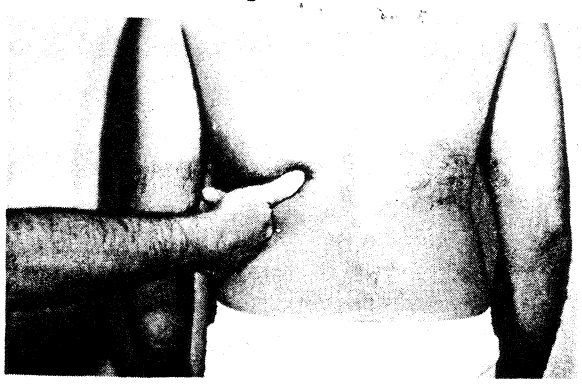


Figure 108 B

MURPHY'S PUNCH: Tests

Procedure: With the patient standing or seated upright, the examiner gives either short chopping blows with the edge of the hand (as in karate) (Fig. 108a) or short jabbing movements with the thumb under the twelfth rib posteriorly on either side (Fig. 108 b). In a positive test lancinating pain which either shoots straight through anteriorly or goes around the chest wall is elicited.

Significance: Deep seated tenderness and muscular rigidity as in kidney inflammation are determined.

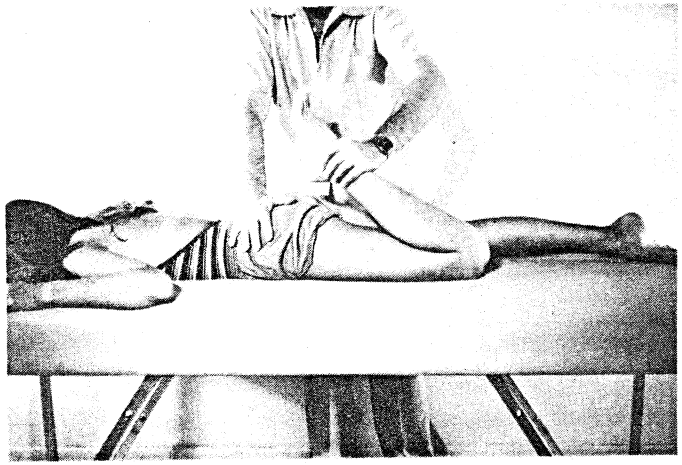


Figure 109

NACHLAS': Test

Procedure: The patient lies prone and relaxed with the lower limbs side by side on a flat, non-yielding examining table. The foot is passively raised from the table and the knee is maximally flexed by the examiner with one hand while the other hand is exerting downward pressure over the pelvis to keep the patient from buckling at the hips (Fig. 109). The test

is positive when the patient experiences pain in the **sacroiliac or lumbosacral** regions and at times, along the nerves that run in front of these joints. Radiating pain follows either that of the sciatic nerve (the back of the limb to the calf) or the external cutaneous nerve (the outer side of the thigh to the knee). If the patient has no skeletal abnormality in the **lower** part of the back, the above symptoms will not be elicited, only a feeling of tension in the anterior thigh. If, however, upper lumbar pain and/or femoral radicular pain is elicited, the maneuver then becomes diagnostic for femoral neuropathy (see Femoral Nerve Stretch Test, **THE ILLUSTRATED MANUAL OF NEUROLOGICAL REFLEXES, SIGNS AND TESTS).**

Significance: A lesion of the lumbosacral and/or sacroiliac joints

Note: The mechanics of this test are simple but not always obvious, when the knee is flexed, the patella and rectus femoris muscle attached to it are pulled distally, rotating the attachment of the muscle, the anterior superior iliac spine, forward and downward; this torsion stress imposes itself on the ipsilateral sacroiliac joint first. When the joint is normal, the sacrum is carried with the ilium so that the strain is applied either to the lumbosacral or contralateral sacroiliac joint.

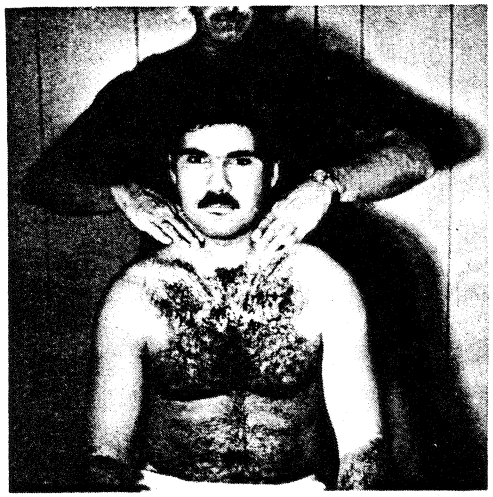


Figure 110

NAFFZIGER'S: Test

Procedure: The examiner faces the back of the patient who is sitting upright, and digitally compresses both internal jugular veins with the index and middle fingers of each hand for a period of up to forty-five seconds (Fig. 110). A more accurate method is to place a blood pressure cuff around the neck, inflate it to a pressure of about 40 mm. of mercury for up to twelve seconds, and observe the results. A positive test elicits radiating sciatic pain.

Significance: In the patient with a true herniated disk, the radiating sciatic pain is either reproduced or aggravated by this maneuver. The test is most frequently positive in those patients who have a history of the pain being aggravated by coughing and sneezing. Occasionally the pain is not aggravated until the jugular pressure is released. The test is mostly used to confirm nerve root compression by an extruded disk or other mass.

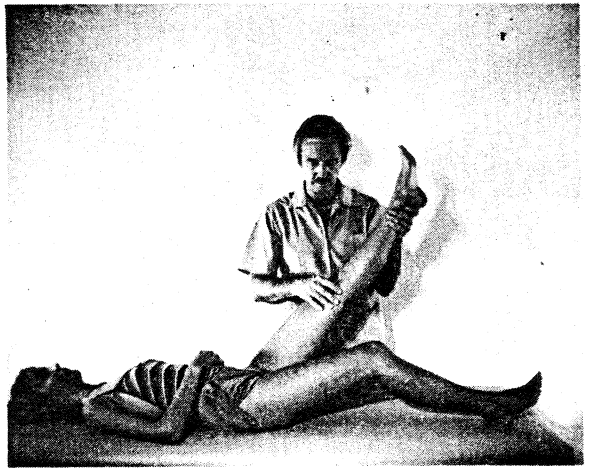


Figure 111 A

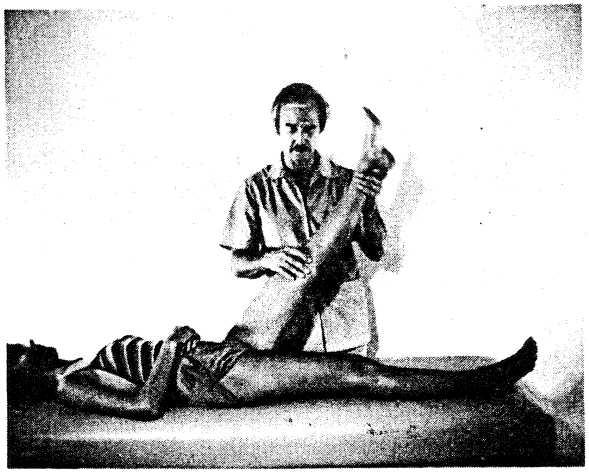


Figure 111 B

NERI'S: Sign

Consists of spontaneous flexion of the knee of the affected side as the examiner gives straight leg raising to the supine patient (Fig. 111a). Normally as the leg is raised passively the opposite knee remains straight (Fig. 111b).

Significance: Organic hemiplegia

Figure 112 A

Figure 112 B

NERI'S BOWING: Sign

The sign is present when, with the knee on the involved side bent into flexion, the patient in the standing position can bend forward, flexing the dorsolumbar spine a greater amount of degrees (Fig. 112a) without low back and/or radicular pain then the patient can achieve with the lower limbs parallel and the knees straight in extension (Fig. 112b).

Significance: The sign is commonly attributed to unilateral tight and spastic hamstrings which can have any number of etiologies, e.g. sacroiliac, lumbosacral or lumbar lesions. It is a fairly constant sign in lumbar radiculopathy and may even be present in sciatic peripheral neuropathy.

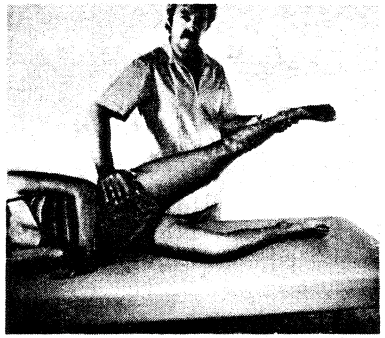


Figure 113 A

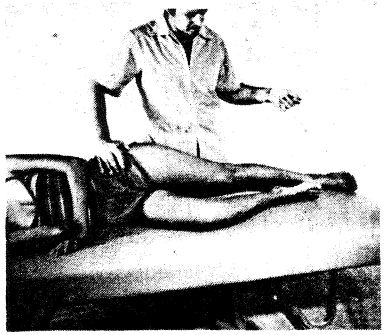


Figure 113 B

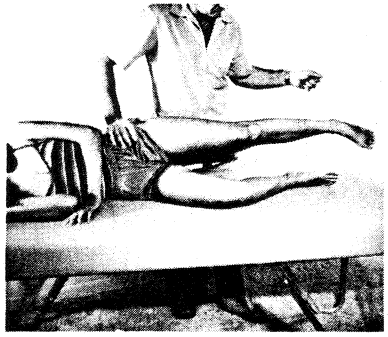


Figure 113 C

OBER'S: Test

Procedure: The patient lies on the side. The side to be tested is superiorward. The underneath hip and knee are flexed at right angles to flatten the lumbar spine and to give stability to the patient. The lower limb to be tested is straight and parallel with the trunk. The examiner with one hand gives firm downward pressure over the ilia not allowing it to move during the test, with the other hand the examiner grasps the patient's ankle, abducts and extends the lower limb (Fig. 113a). When the hip is fully extended the examiner allows the straight limb to fall into adduction. Normally the limb when in a straight line with the trunk will fall beyond the midline to the table (Fig. 113b). If the leg remains more or less passively abducted (Fig. 113c) and does not fall to the table the test is possitive.

Significance: Abduction contracture of the hip: shortening of the iliotibial band, this band can be easily felt with the examining fingers between the crest of the ilium and the anterior aspect of the greater trochanter. In some cases the pain on one side can be increased by doing the abduction test on the opposite side. The angle the thigh makes with a horizontal line parallel to the table represents the degree of contracture. The sign is present both in the conscious and comatose patient.

Synonym: The Abduction Test

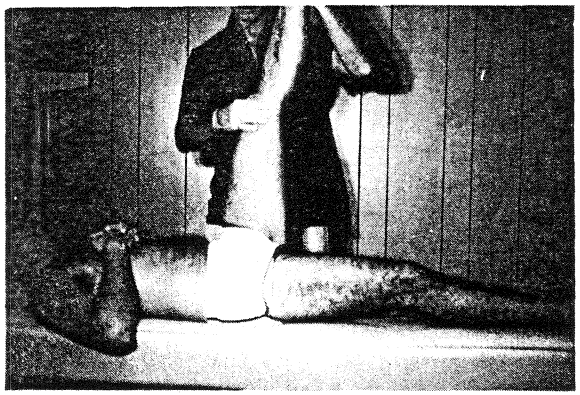


Figure 114 A

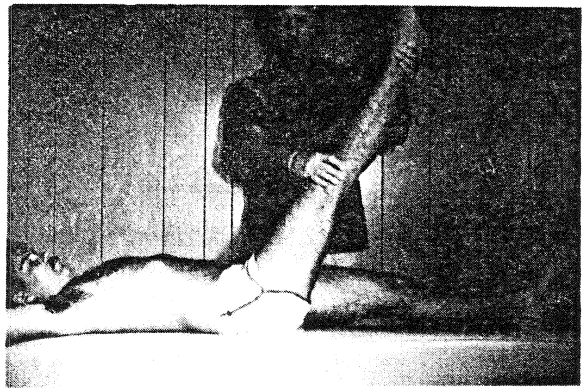


Figure 114 B

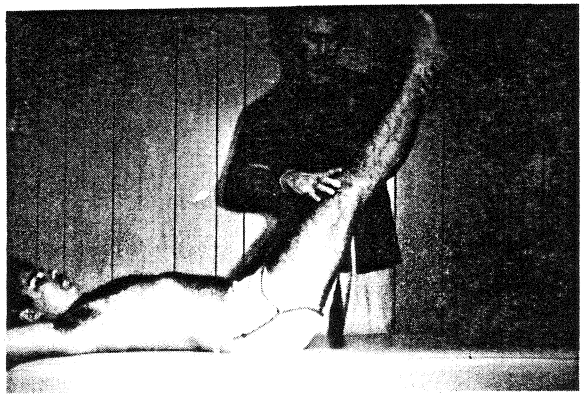


Figure 114 C

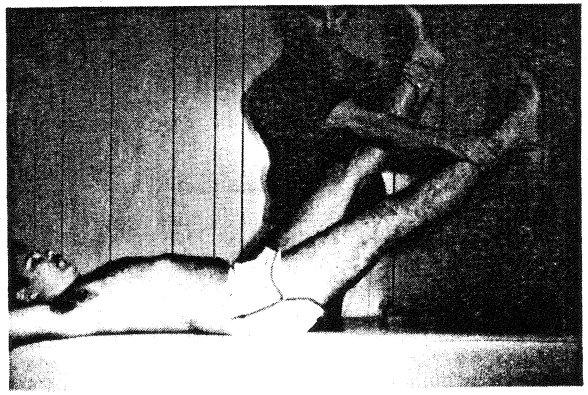


Figure 114 D

O'CONNELL'S: Test

Procedure: The well leg is straight leg raised by the Lasegue maneuver with the angle of flexion and site of pain (if any) recorded (Fig. 114a). The affected limb is then tested in the same manner and the findings recorded (Fig. 114b). Then, with both knees extended, both thighs are simultaneously flexed to an angle just short of that which produces pain (Fig. 114c). The sound side is then lowered (Fig. 114d), if this lowering causes a marked exacerbation of pain on the affected side, the test is positive.

Significance: Lumbar peripheral neuropathy; the test is evidence of true neuritis proximal to the distal extent of the radiculopathy.

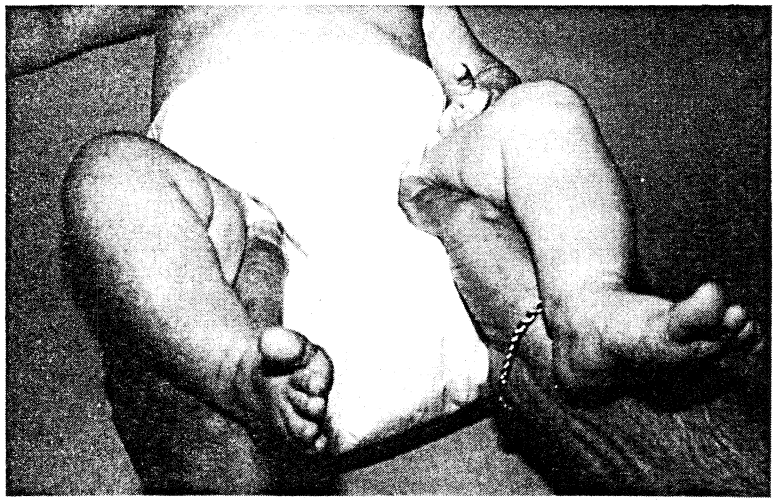


Figure 115 A

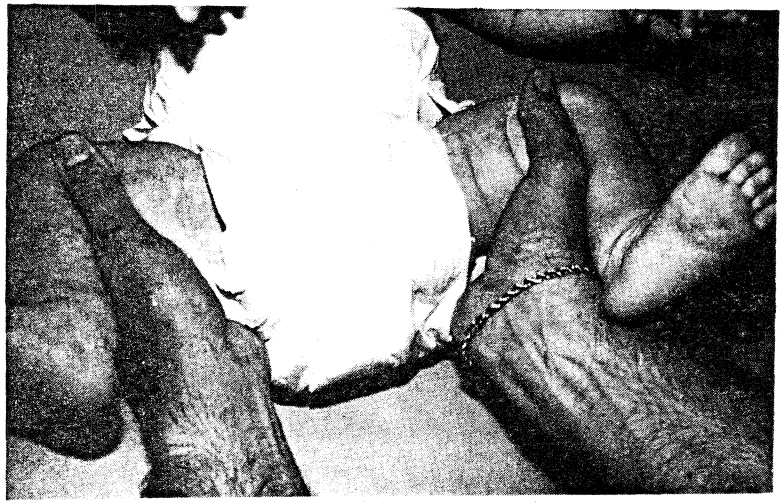


Figure 115 B

ORTOLANI'S: Sign

This sign consists of a palpable and/or audible click when the flexed hip is abducted, it is caused by the femoral head slipping over the rim of the acetabulum into its proper position. It is present up to eight weeks after birth. The sign is elicited with the infant lying supine, the legs are held as illustrated (Fig. 115a) and each hip in turn is slowly abducted. It is an advantage to place the tip of the middle finger behind the trochanter and exert slight forward pressure (Fig. 115b).

Significance: Congenital dislocation of the hip; instability of the hip may also be detected in a similar way (see Barlow's Test).

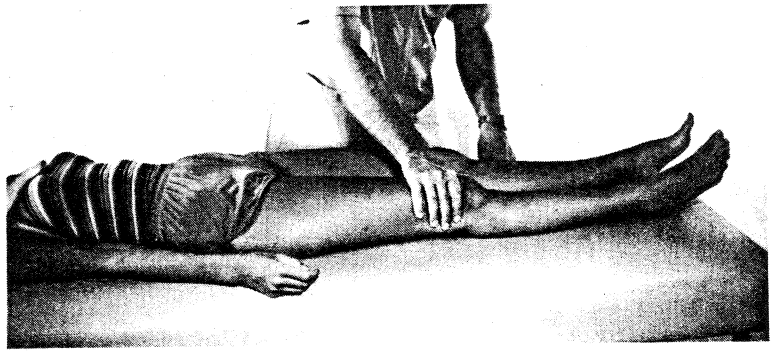


Figure 116 A

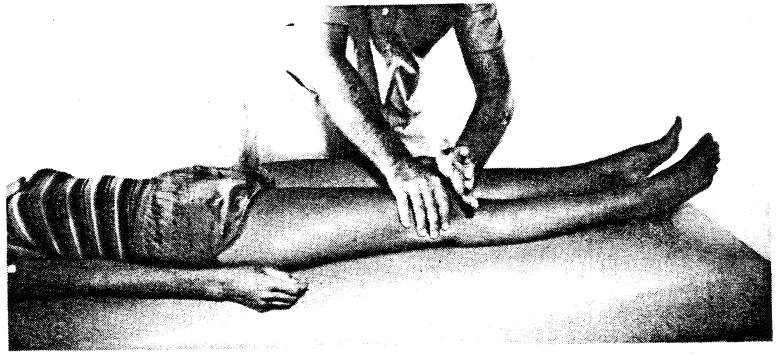


Figure 116 B

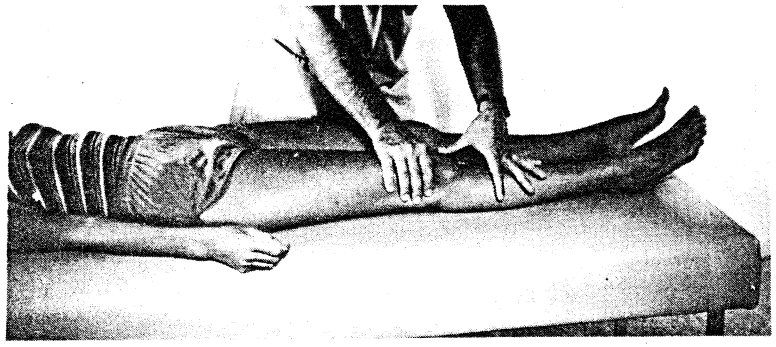


Figure 116 C

PATELLAR TAP: Test

Procedure: With the patient supine and the lower limbs straight out and parallel, the examiner with one hand compresses the suprapatellar pouch from above downwards forcing any fluid into the retropatellar region (Fig. 116a). If there is enough fluid to lift the patella away from the condyles of the femur, the patella with a quick gentle thrust with the thumb, thenar or hypothenar prominence can be pushed back against the condyles (Figs. 116b & c) with a palpable tap.

Significance: The test reveals that there is a certain amount of effusion within the knee, the presence of a small amount.

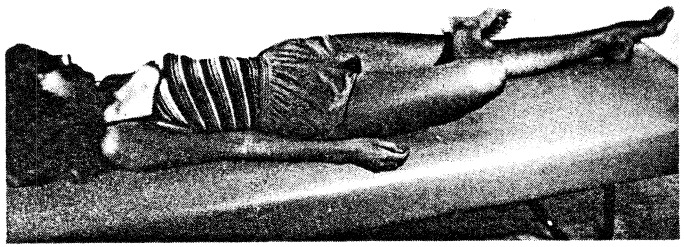


Figure 117 A

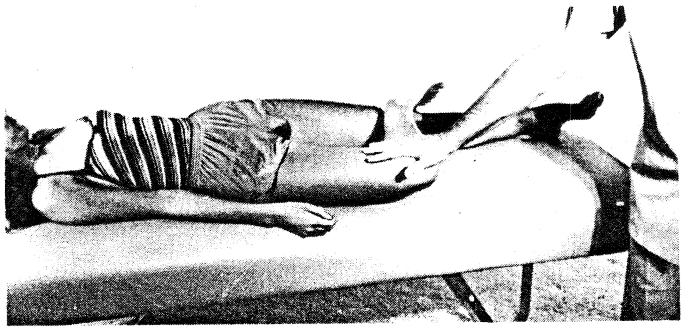


Figure 117 B

PATRICK'S: Test

Procedure: With the patient supine, the examiner places the external malleolus of the suspected limb over the patella of the opposite side (Fig. 117a). Downward pressure on the thigh is then exerted by the hand of the examiner (Fig. 117b). A positive test is revealed when hip pain, especially in the area of the hip flexors, is elicited.

Significance: Hip joint disease - the test mainly antagonizes hip flexor spasm brought on by an inflammatory lesion.

Synonym: Called the FABERE Sign from the acronym of the maneuvers involved: flexion, abduction, external rotation and extension; also called The Sign of Four Test.

Figure 118

PAYR'S: Sign

With the patient in the Turkish sitting position, e.g. with the feet and ankles crossed, the examiner applies downward pressure on the knee joint (Fig. 118). Pain on the medial side of the joint is elicited when the sign is present.

Significance: A lesion of the posterior horn of the medial meniscus

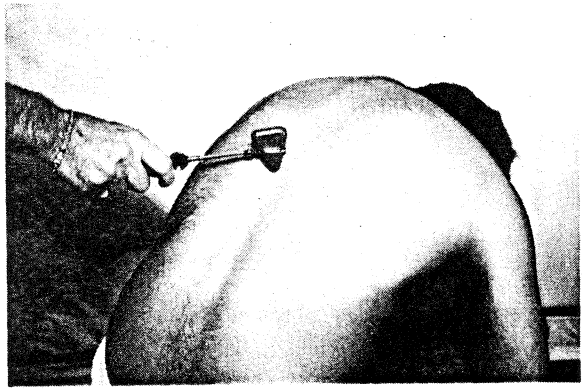


Figure 119 A

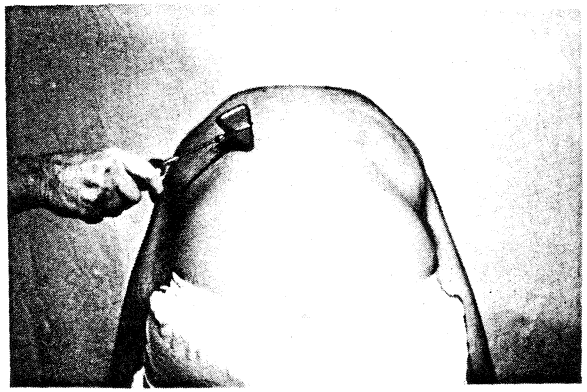


Figure 119 B

PERCUSSION: Test

Procedure: The patient assumes the Sitting Adam's Position (see Adam's Positions). The examiner stands behind the patient and using a reflex hammer, strokes the spinous processes within and just outside the spinal area of complaint (Fig. 119a), first going superiorly and then repeating the process inferiorly. After percussing the spinous processes, the examiner percusses the paraspinal musculature in the same manner (Fig. 119b). The test is positive when the percussion reproduces or aggravates the pain of the main complaint.

Significance: Pain on percussing the spinous processes: joint lesion (sprain, subluxation, dislocation, etc.) Pain on percussing spinal musculature: soft tissue lesion (strain, rupture, etc.). (see Manual Percussion)

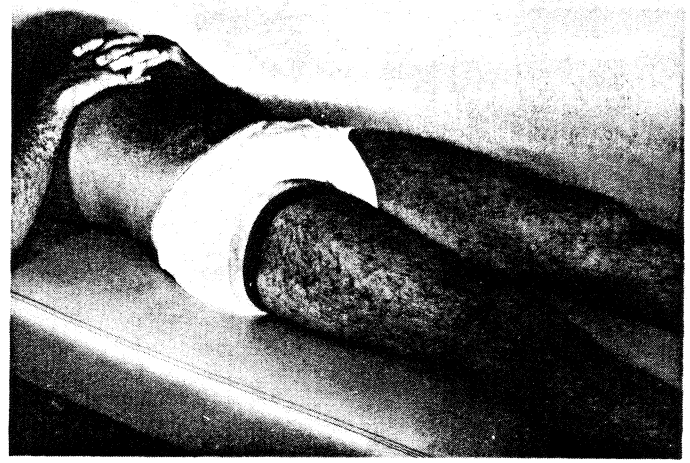


Figure 120 A

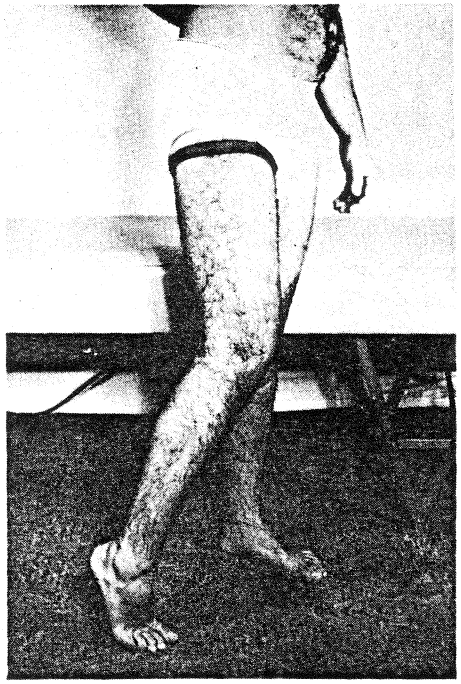


Figure 120 B

PERTHE'S: Test

Procedure: With the patient standing, an elastic tourniquet is applied around the upper thigh sufficient to compress only the Long Saphenous Vein (Fig. 120a). The patient then exercises the limb briskly, e.g. walking, kicking, twisting (Fig. 120b), etc. for up to sixty seconds. The examiner then notes the prominence of the varicosities. Normally the muscular action of the exercise should empty the blood from the superficial system (Long Saphenous) through the communicating veins into the deep system.

Significance: 1. If superficial varicosities disappear: valves of the communicating and deep veins are competent. 2. If superficial varicosities remain the same: both superficial and communicating valves are incompetent. 3. If the varicosities become distended and more prominent and also pain

develops: the deep veins are obstructed and the valves of the communicating veins are incompetent.

Synonym: The Tourniquet Test

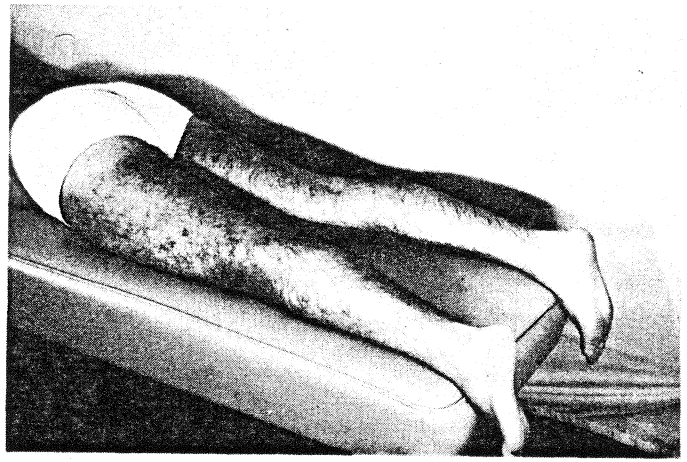


Figure 121 A

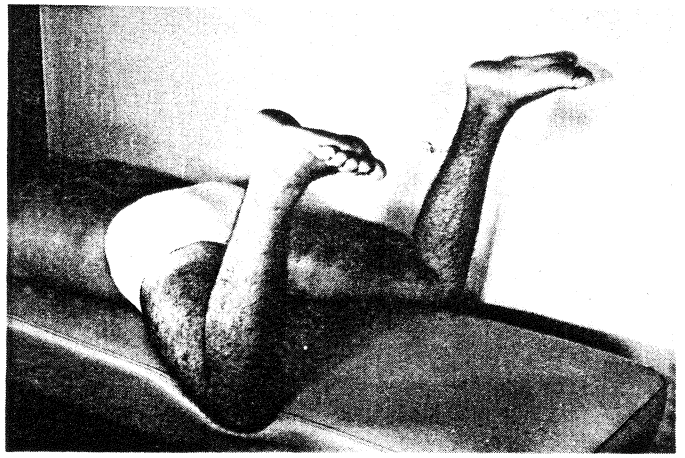


Figure 121 B

PHELP'S: Test

Procedure: The patient is prone, the knees are extended and the thighs are maximally abducted using pain and resistance as a criterion for maximum abduction (Fig. 121a). The examiner then flexes the patient's knees bilaterally to a right angle and notes if this maneuver will allow more hip abduction (Fig. 121b). The test is positive if knee flexion increases and knee extension decreases hip abduction.

Significance: Contracture of the Gracilis Muscle.

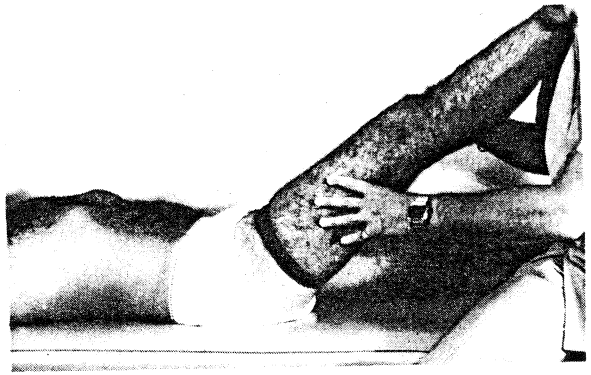


Figure 122 A

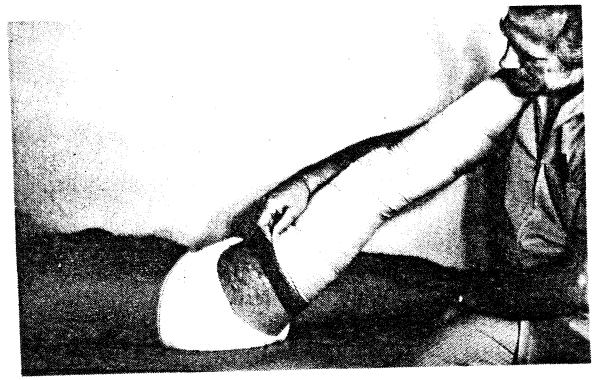


Figure 122 B

Figure 122 C

Figure 122 D

PRATT'S: Test

Procedure: The recumbent patient elevates the lower limb and empties the veins, the lower limb resting on the examiner's shoulder. A tourniquet compressing the Long Saphenous vein at the upper thigh as in Perthe's Test is applied (Fig. 122a). An elastic bandage is applied from the toes to the tourniquet (Fig. 122b). The patient then stands erect and the bandage is slowly unwound from above downward. Reflex blood from above is prevented by the tourniquet, so that the appearance of a bulge or blowout in the tissues of the leg as it is unwrapped indicates the site of an incompetent communicating vein which is then marked (Fig. 122c). After the first blowout a second bandage is applied from the level of the tourniquet down to and covering the initial blowout; then the first bandage is again unwound downward to the next blowout, which is again marked, and compressed by the second bandage (Fig. 122b). The procedure is continued until all blowouts or bulges are identified.

Significance: Each blowout or bulge represents an incompetent communicating vein. While the bandages are applied, severe pain and swelling in the calf indicate occlusion of the deep veins.

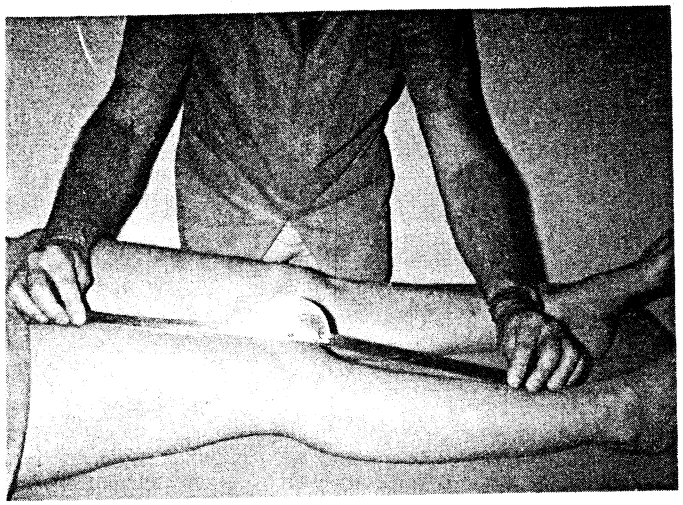


Figure 123

Q-ANGLE: Test

Procedure: With the patient supine and relaxed on a firm, flat table, the examiner measures the Q-angle of the knee by placing a goniometer directly over the center of the patella with one arm aimed at the antero-superior spine of the ilium and the other arm in line with the center of the patellar tendon (Fig. 123). This is the angle between the long axis of the femoral shaft and a line from the middle of the patella to the tibial tubercle. In women this angle normally measures 15 degrees and in men 10 degrees.

Significance: The angle may be dynamically increased with external tibial rotation. When the tibia is externally rotated, the tibial tubercle is displaced laterally, thus increasing the angle and with a vigorous quadriceps contraction, the increased resultant force tends to displace the patella laterally. This condition makes for a patella which is extremely vulnerable to subluxation or dislocation when the flexed knee is extended with the leg externally rotated.

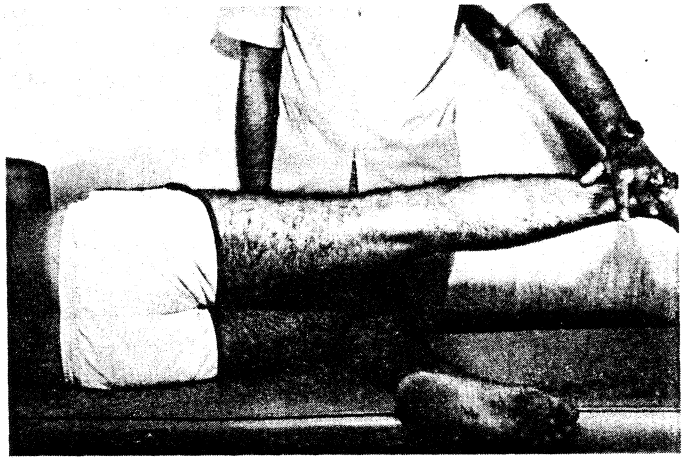


Figure 124

SACROILIAC RESISTED ABDUCTION: Test

Procedure: The patient lies on the side with the superior lower limb straight out and slightly abducted, the inferior lower limb is flexed at the hip and knee to give stability. The examiner then gives downward pressure on the abducted limb against the patient's resistance (Fig. 124). The test is repeated on the opposite side. The test when positive elicits pelvic pain around the posterior superior iliac spine.

Significance: The test is specific for a sacroiliac sprain or subluxation and general for any sacroiliac lesion.

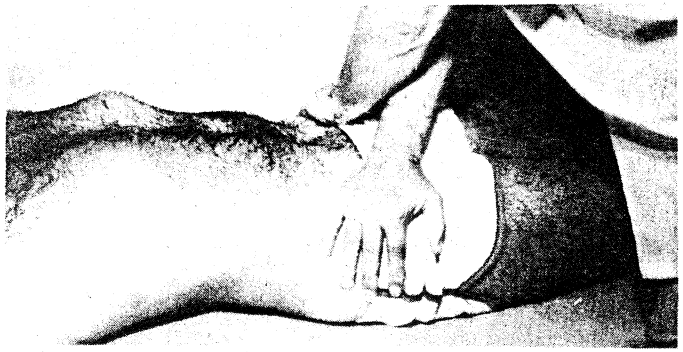


Figure 125

SACROILIAC STRETCH: Test

Procedure: The patient lies supine, the examiner places his hands on the anterior superior spine of each ilium and presses downward and laterally. Crossing the arms increases the lateral component of the strain on the ligaments (Fig. 125). The test is positive only if the patient can identify deep seated unilateral gluteal or posterior crural pain in contradistinction to pain due to table pressure on the skin over the sacrum (centrally), that made from the examiner's hands or that from the lumbosacral area because the pelvis was rocked.

Significance: Anterior sacroiliac ligament strain

Figure 126 A

Figure 126 B

SHOULDER COMPRESSION: Test

Procedure: With the patient sitting upright on a low stool or table, the examiner palpates the distal apex of the coracoid process and marks it with a flesh pencil (Fig. 126a). With a hypothenar contact the examiner then proceeds to apply downward pressure over the area marked (Fig. 126b). Production of symptoms similar to neurovascular compression of the Subclavian Artery and Brachial Plexus constitute a positive test.

Significance: Coracoid Pressure Syndrome identical to hyperabduction type of Thoracic Outlet Syndromes

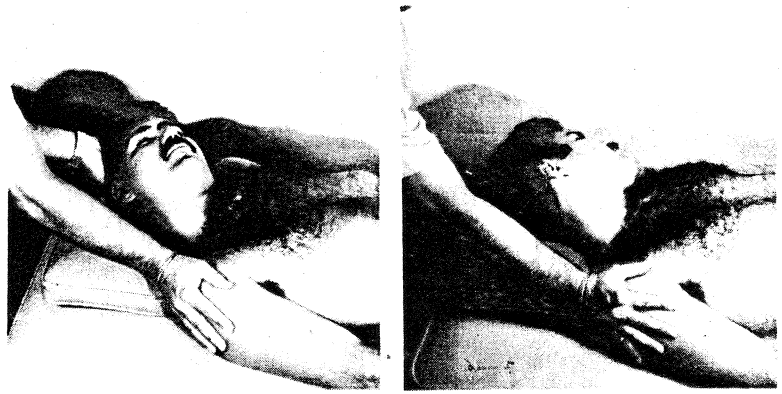


Figure 127 A

Figure 127 B

SHOULDER DEPRESSION: Test

Procedure: With the patient lying supine, the examiner, standing at the head of the patient on the affected side, with one hand pushes the shoulder caudadward while laterally flexing the cervical spine to the opposite shoulder (Fig. 127a). With the shoulder still stabilized, rotation of the cervical spine to the **opposite** side follows the lateral flexion (Fig. 127B). Radicular pain, produced or aggravated by the first

maneuver and confirmed by the second reveals a positive test.

Significance: Adhesions of the dural sleeves, the spinal nerve roots or the adjacent structures of the joint capsule on the side opposite lateral flexion.

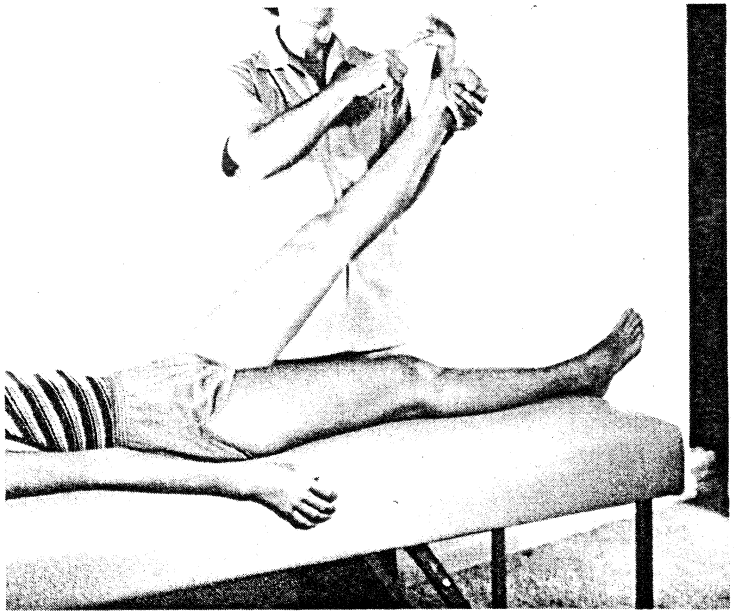


Figure 128

SICARD'S: Sign

A modification of the Lasegue test: With the patient supine, the extended leg is raised to a point just short of producing pain, dorsiflexion of the great toe brings out sciatic pain when the sign is present (Fig. 128).

Significance: Sciatic radiculopathy (See also TURYN'S Sign)

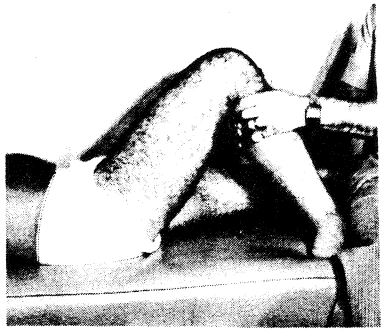


Figure 129 A

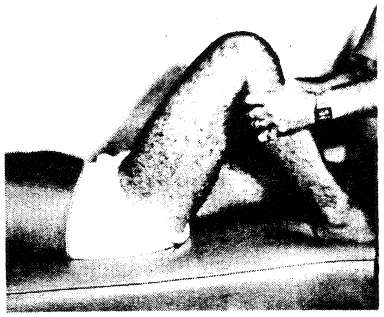


Figure 129 B

SLOCUM'S: Test

Procedure: With the patient in the recumbent position, the hip and knee are flexed with the knee flexed to ninety degrees and the foot fixed to the examining table by the examiner sitting on the forefoot. The tibia is pulled forward on the femur as in testing for anterior cruciate instability in each of two positions. In the first position the leg and foot are placed in thirty degrees of internal rotation to tighten the lateral and posterolateral ligamentous apparatus to a point where forward displacement will be prevented (Fig. 129a). In the second position, the foot and leg are placed in fifteen degrees of external rotation (Fig. 129b) to relax the anterior cruciate and lateral ligaments and so permit forward and outward movement of the medial side of the tibia if the medial capsular ligaments have been ruptured. Forward displacement of one plus (+) is one-half inch, two plus (++) is one-half to three-fourths inches, three plus (+++) is over three-fourths inches.

Significance: Rotation instability of the knee

Snyonym: Rotary Instability Test

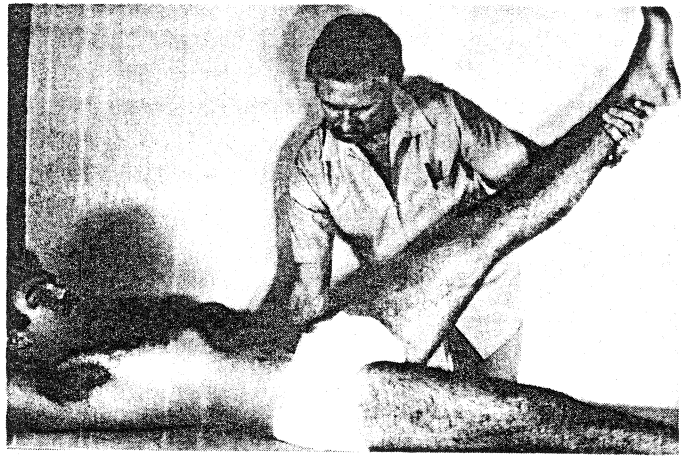


Figure 130

SMITH-PETERSON: Test

Procedure: With the patient in the supine position, the examiner with one hand placed under the low back palpates movement of the lumbosacral spine as in the Goldthwait test, while the other hand performs straight leg raising (Fig. 130).

Significance: In the presence of acute inflammation, motion is more limited toward the side affected than away from it. In sacroiliac strain the opposite is true. If pain is brought on before lumbosacral movement, the test is positive for a sacroiliac condition. If, however, pain comes on after lumbosacral movement, either a sacroiliac or a lumbosacral lesion may be present. If there is a sacroiliac lesion, the leg on the opposite side can be brought to a higher level without pain. If there is a lumbosacral lesion, pain comes on when both legs are brought to the same level.

Figure 131

SOTO-HALL: Test

Procedure: The patient lies supine without pillows, the examiner places one hand upon the sternum of the patient exerting pressure so that no flexion takes place at either the lumbar or thoracic spines; at the same time the examiner's other hand is placed under the occiput which is then flexed upon the neck, following this the head and neck are slowly and forcibly flexed upon the sternum (Fib. 131) producing a progressive pull on the posterior spinous ligaments starting at the Ligamentum Nuchae above and being transmitted downward to the interspinous ligaments until it reaches the spinous process of the involved vertebra where it acts as a lever compressing the body and producing local pain.

Significance: Diagnosis and localization of vertebral bony disease and injuries, especially those of compression

Figure 132 A

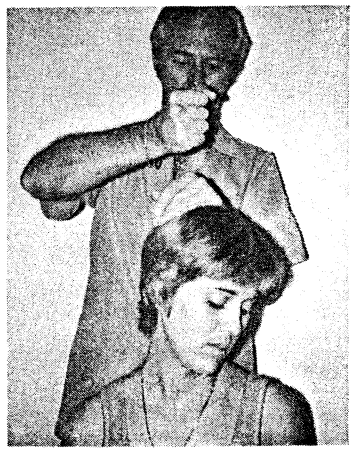


Figure 132 B

SPURLING'S: Test

Procedure: The patient is seated on a low stool or chair to enable the examiner to get well over the patient's head. The examiner stands slightly posterior and on the side being tested. If the right side is the side of the main complaint, for example, the patient turns the head in maximal right axial rotation and then maximal right lateral flexion is added (Fig. 132a). With the head and neck in this position a vertical blow is delivered to the uppermost portion of the cranium by the examiner (Fig. 132b). This procedure is done on both sides when the complaint is bilateral. When it can be tolerated by the patient, hyperextension can be added to the initial movements which may be passively elicited by the examiner. A positive test would be a significant increase of any combination of neck, shoulder, or arm pain when the blow is delivered with the head and neck in the described position.

Significance: The test should stimulate any nerve root irritation or other pain-sensitive structures related to disk disease and cervical spondylosis.

Synonym: The Foraminal Compression Test of Spurling

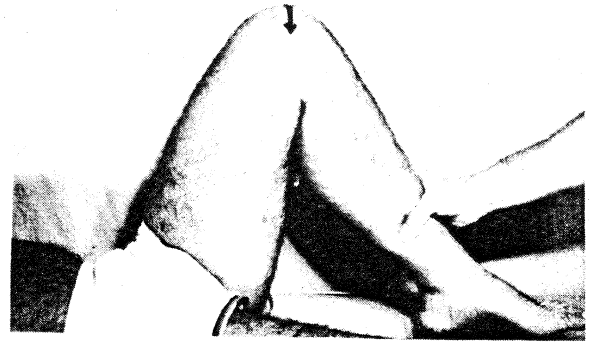


Figure 133 A

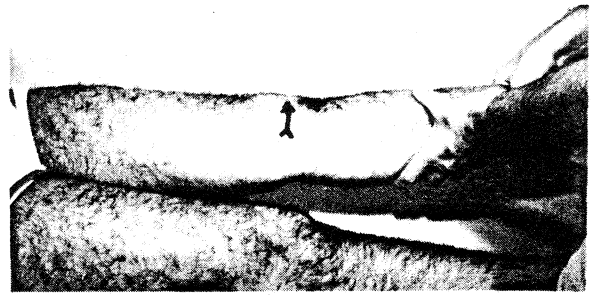


Figure 133 B

STEINMANN'S: Sign

The patient, upon active flexion of the knee joint, displaces a point of tenderness from over the anterior joint line medially towards the collateral ligament (Fig. 133a). Extension of the knee produces the reverse, displacing the point of tenderness anteriorly again (Fig. 133b).

Significance: A lesion of the medial meniscus in the above case, should anterior joint tenderness become displaced laterally by flexion and anteriorly again from extension, a lesion of the lateral meniscus is evidenced.

Note: A meniscal cause of joint tenderness will move in the same direction.

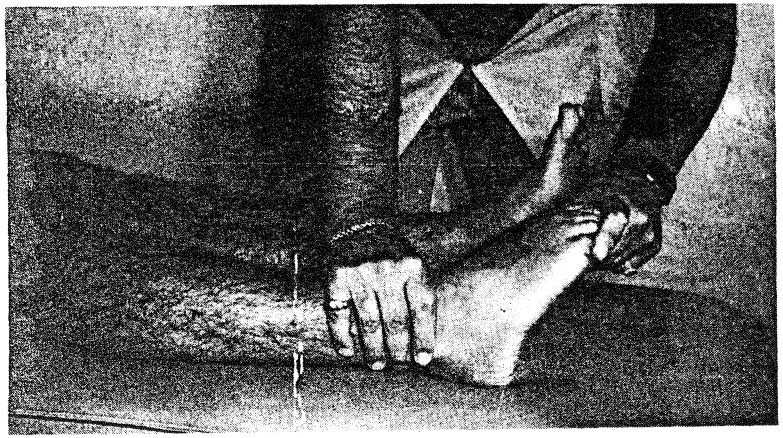


Figure 134

STRUNSKY'S: Sign

With the patient supine and one foot resting lightly in the examiner's hand, the other hand of the examiner grasps the patient's toes and flexes them suddenly (Fig. 134). This procedure is painless in a normal foot. When lancinating pain is produced, the sign is present.

Significance: Inflammation of the anterior arch of the foot, chiefly the Metatarsophalangeal Joints.

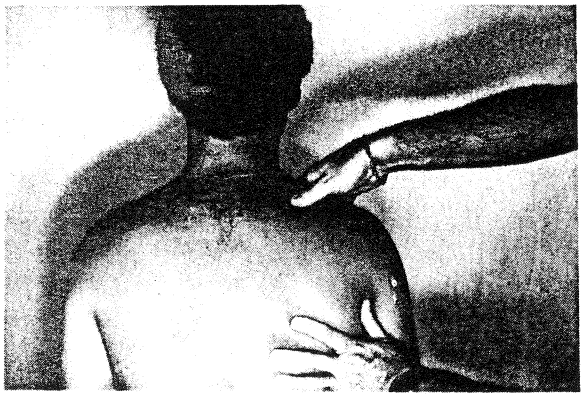


Figure 135

SUPRASPINATUS PRESS: Test

Procedure: The patient is seated with the upper extremities hanging limply at the sides. The examiner exerts strong thumb pressure toward the midline at a midclavicular point above the scapular spine (Fig. 135). The production or increase of shoulder pain reveals a positive test.

Significance: Rotator cuff tear of the Supraspinatus Tendon

Synonym: Mazion's Cuff Maneuver

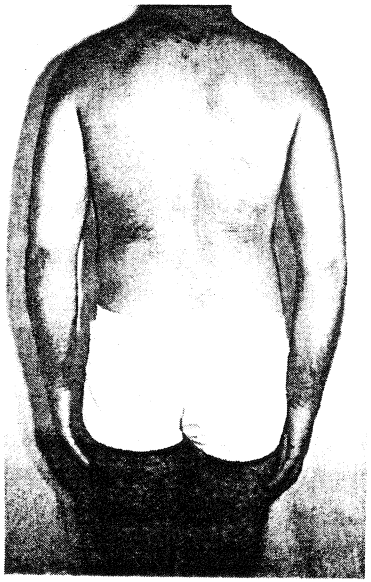


Figure 136 A

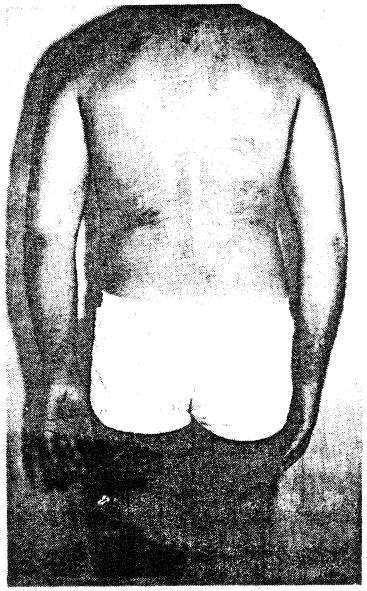


Figure 136 B

TERES: Test

Procedure: The patient with arm pain stands upright with the arms hanging limp and relaxed. The examiner observes the patient from behind. Normally the arms will rest in such a

manner that the palms will be facing the thighs (Fig. 136a), the test is positive when on the affected side the palm faces posteriorward (Fig. 136b).

Significance: Spasm of the Teres Major Muscle (The Teres Syndrome)

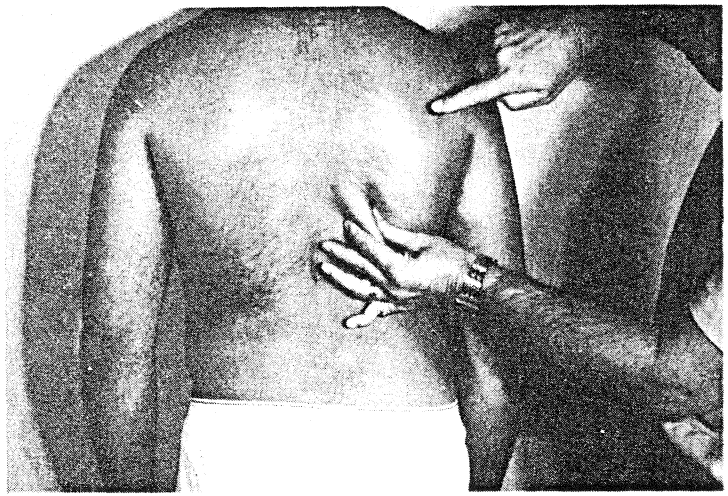


Figure 137

THOMAS': Sign

Pinching of the trapezius muscle (Fig. 137) causes gooseflesh above the level of the lesion.

Significance: A Spinal Cord lesion

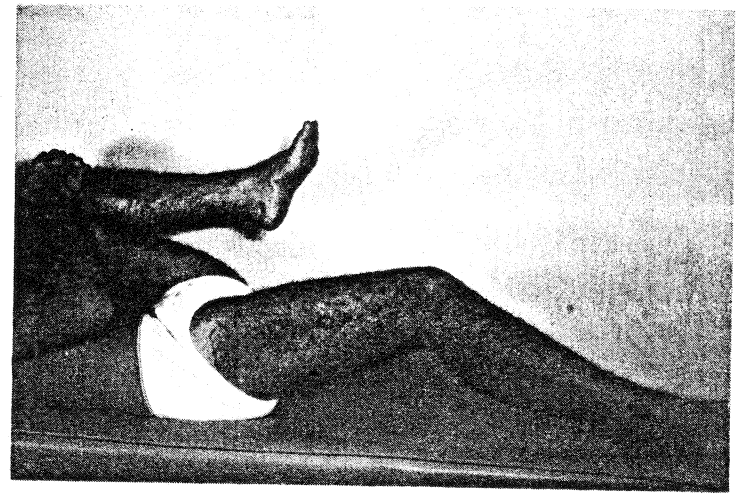


Figure 138

THOMAS': Test

Procedure: The patient lies supine with no pillows, the body and lower limbs are straight and resting on an examining table. The examiner maximally flexes the hip and knee of the side opposite that being tested, bringing the knee to the patient's chest and directing the patient to clasp the hands around the knee and maintain this posture; the examiner standing ready to assist should the patient not be able to comply. With the knee approximated to the chest the examiner observes the opposite limb. The thigh and knee should be resting **flat** on the table. Elevation of the thigh or knee with a space between the limb and table constitutes a positive test (Fig. 138).

Significance: Normally the lower limb should have enough hip flexor stretch to allow extension of the thigh so that it lies flat on the table. With flexor tightness or in flexion deformity of the hip, the extention is absent.

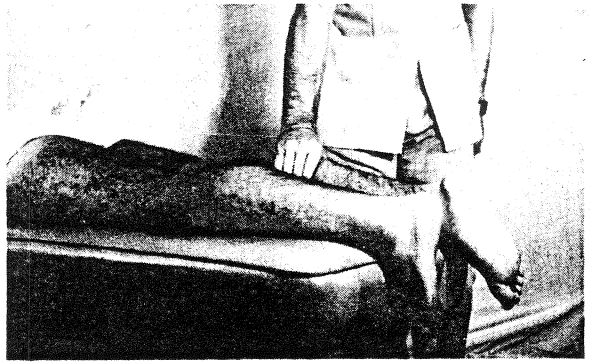


Figure 139 A

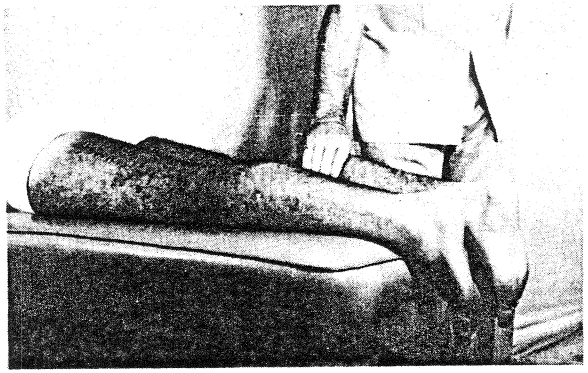


Figure 139 B

THOMPSON'S: Test

Procedure: The patient is prone with the feet hanging over the edge of the examining table. The examiner squeezes the calf muscles of the affected side just below the widest level of the posterior portion of the leg. Normally this causes reflex plantar flexion of the foot (Fig. 139a). The test is positive when the foot does not respond (Fig. 139b).

Significance: Complete rupture of the Achilles Tendon

Synonym: Simmond's Test

Figure 140 A

Figure 140 B

TRENDELENBURG: Test

Procedure: The patient is standing and holding onto a support for balance, e.g. the wall, the back of a chair, etc. The examiner observing from behind, directs the patient to stand on one foot and lift the opposite knee above the level of the patient's waist. Normally this action will elevate the gluteal fold along with the pelvis of the ipsilateral side above that of the standing leg side (Fig. 140a). The procedure is done bilaterally. The test is positive when the gluteal fold (pelvis) is lowered by raising the leg on the same side (Fig. 140b).

Significance: Gluteal (Abductor) insufficiency on the standing leg side. As one lower limb is lifted in the standing position, the hip abductors on the opposite side contract, bringing the pelvis down on the standing leg side. When these muscles are weak from any number of causes, e.g. coxa vara, coxa valga, congenital dislocation, etc., they are unable to stabilize and bring the pelvis down on the ipsilateral side so the pelvis on the raised side falls.

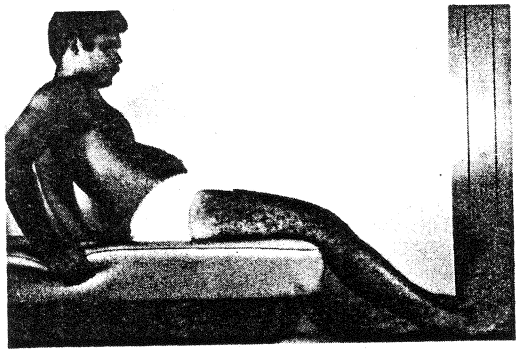


Figure 141

TRIPOD: Sign

With the patient seated, legs dangling over the table at the knees, active and passive motion of the knees are tested to observe how the patient responds to full knee extension. If, when the knees are bilaterally extended, the patient extends the trunk and leans back on the upper extremities (Fig. 141), the sign is present.

Significance: Tightness of the Hamstring Muscles which can be seen in almost any spinal irritation from the midthoracic area to the sciatic notch.

Figure 142

TURYN'S: Sign

With the patient in the supine position, both lower limbs resting on the table and straight out, dorsiflexion of the great toe (Fig. 142) elicits pain in the gluteal region.

Significance: Sciatic radiculopathy

Figure 143

VALSALVA: Maneuver/Test

Procedure: The patient with cervical problems is directed to bear down as if straining at the stool by way of forcible exhalation effort against the closed glottis thereby increasing intrathoracic pressure (Fig. 143). If this action increases cervical pain and radicular neuralgia, the test is positive.

Significance: Intervertebral nerve root compression by way of disk occlusion

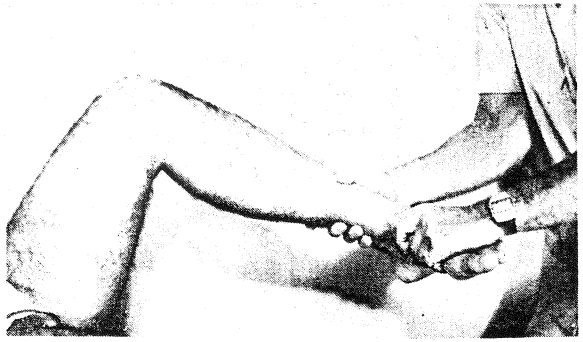
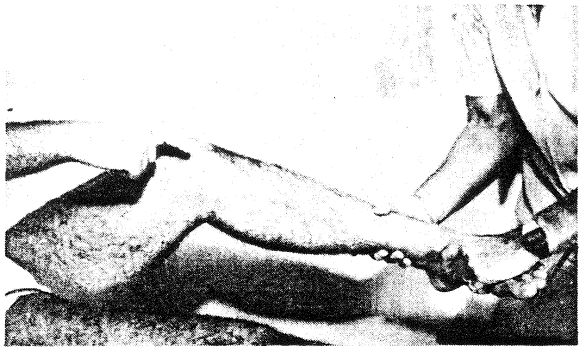
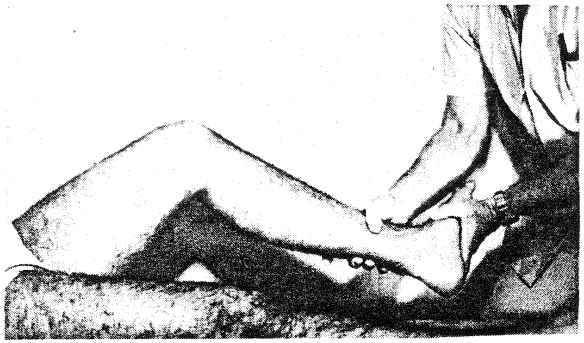


Figure 144 A



Painful

Figure 144 B



Non-Painful

Figure 144 C

WILSON'S: Sign

Procedure: With the patient supine, the affected knee is flexed to a right angle and the leg is internally rotated fully (Fig. 144a). The knee is gradually extended while maintaining the internal rotation and at approximately thirty degrees of flexion (Fig. 144b), the patient will complain of pain over the anterior aspect of the medial femoral condyle. The pain is relieved at this point on external rotation of the leg (Fig. 144c).

Significance: Osteochondritis of the knee

Figure 145 A

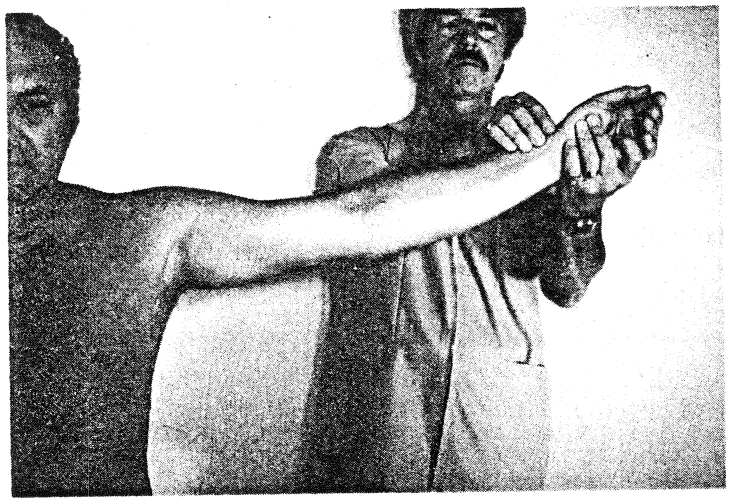


Figure 145 B

WRIGHT'S: Test

Before this test is given, an Allen's Test is performed to establish patency of the radial arteries so it can be determined that Wright's Test was responsible for the results as opposed to them already being there from another underlying pathology.

Procedure: The patient is seated upright with both arms hanging at the sides, the examiner is behind, facing the patient's back. With the examiner palpating the radial pulse, both arms in turn are abducted to one hundred and eighty degrees actively (Fig. 145a) and passively (Fig. 145b), the examiner noting at how many degrees of abduction the radial pulse on the affected side diminishes or disappears when compared with the opposite side.

Significance: Neurovascular compression of the Axillary Artery as seen in the Hyperabduction Thoracic Outlet Syndrome.

Note: Many patients have cessation of the radial pulse upon abduction in the absence of the Hyperabduction Syndrome,

for this reason the non-affected side is used for comparison. If the non-affected limb shows radial pulse dampening or cessation both actively and passively at the same approximate degree of abduction as the affected side, the test is not positive for Hyperabduction Syndrome.

Synonym: The Hyperabduction Maneuver

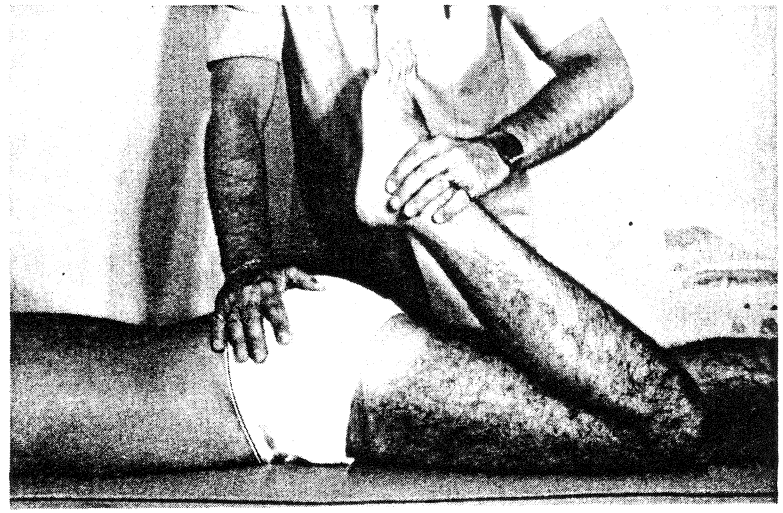


Figure 146 A

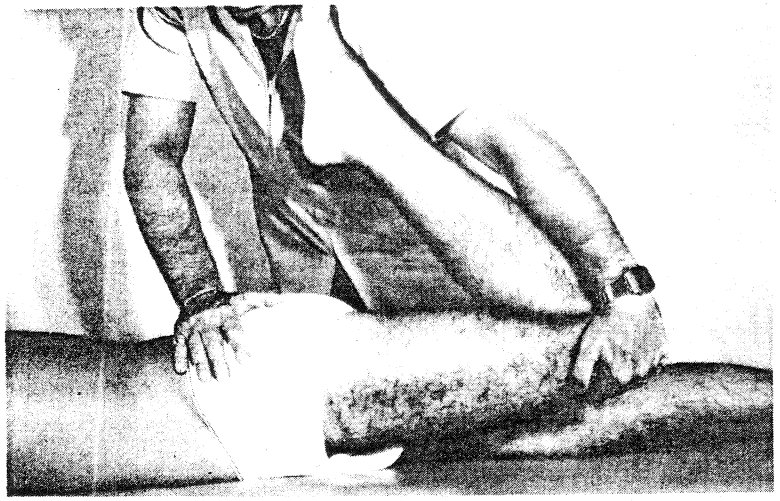


Figure 146 B

YEOMAN'S: Test

Procedure: With the patient prone, the examiner with one hand exerts downward pressure over the suspected sacroiliac joint while with the other hand the examiner maximally flexes the ipsilateral knee (Fig. 146a) and from this position hyperextends the thigh lifting it from the table while holding down the pelvis with the other hand (Fig. 146b). Pain deep in the sacroiliac joint constitutes a positive test.

Significance: Strain of the anterior sacroiliac ligaments

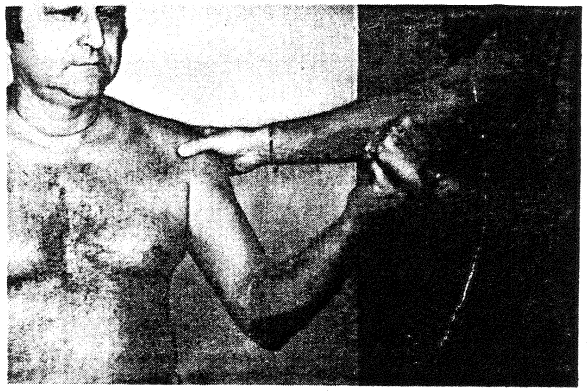


Figure 147 A

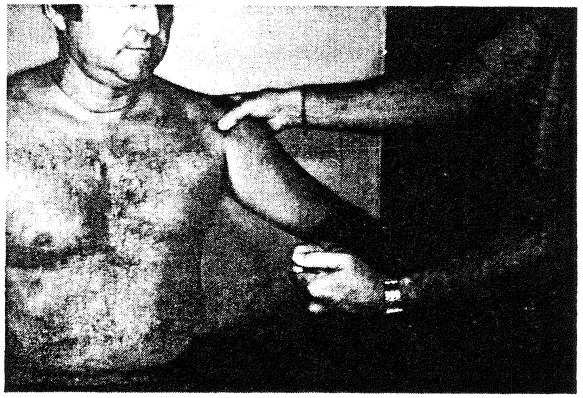


Figure 147 B

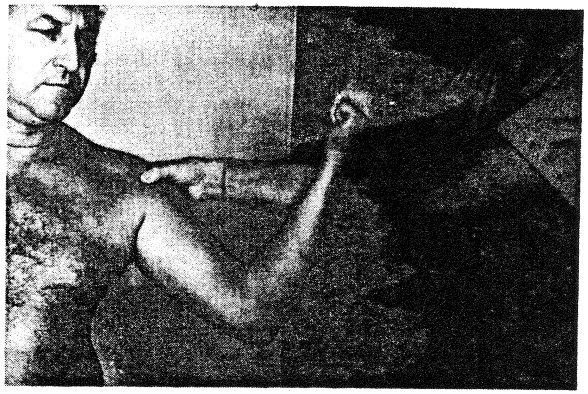


Figure 147 C

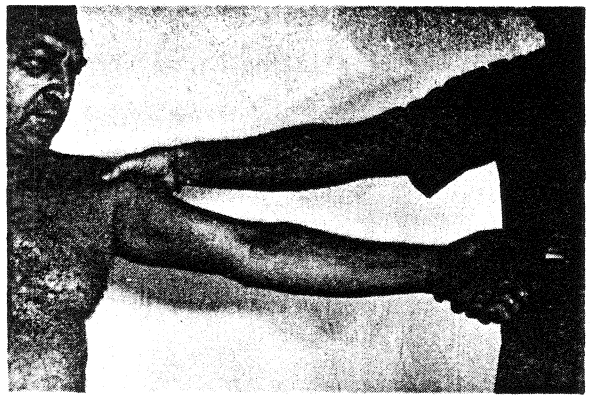


Figure 147 D

YERGASON'S: Test

Procedure: The patient is seated on an examining table, the examiner stands facing the patient and slightly lateral to the upper limb to be tested. The patient with palm facing upward, makes a fist and bends the elbow to approximately ninety degrees. The examiner with one hand digitally palpates over the ipsilateral bicipital groove while the other hand clasps the patient's fist (Fig. 147a). The patient is then directed to put approximately fifteen to twenty pounds effort in maximally flexing the elbow while the examiner keeps the elbow from further flexion and at the same time internally and externally (Figs. 147b & c) rotates the arm. The test is positive when a painful palpable and/or audible snap or click is elicited as the bicipital tendon slips in and out of the bicipital groove.

Another procedure for this test: The patient extends the arm full length out in front, grasping the examiner's hand (as in shaking hands) and gives resistance as the examiner rotates the arm internally and externally while palpating the bicipital grove (Fig. 147d).

Significance: Loss of stability of the Biceps' Tendon

PATIENT CASE RECORD

DR: _____
NAME: _____ AGE: ____ DATE: _____
INTERVIEWER: _____
ADDRESS: _____
TELEPHONE NO.: _____ SOCIAL SECURITY NO.: _____
BIRTHDATE: _____ SEX: M F MARITAL STATUS: M S W D Sep
NAME OF SPOUSE: _____ NO. CHILDREN _____ W B O
EMPLOYER: _____ ADDRESS: _____
EMPLOYER'S TELEPHONE NO.: _____ OCCUPATION: _____
REFERRED BY: _____

INSURANCE INFORMATION
Medicare: Yes No Number _____ Co. _____
Blue Shield: Yes No Workmen's Comp: Yes No Co. _____
Major Medical: Yes No Co. _____ Personal Injury: Yes No Co. _____

CIRCUMSTANCES of FIRST CONTACT:
Treating Physician ____ Emergency ____ Consultant ____ Evaluation ____ Requested by: _____

I. MAIN COMPLAINT(S)
What part bothers you Most:
1. _____ Duration: _____ Radiation: _____
Relieves: _____ Aggravates: _____
Description: _____

Next most:
2. _____ Duration: _____ Radiation: _____
Relieves: _____ Aggravates: _____
Description: _____

Next:
3. _____

Next:
4. _____

What caused pain: Patient stated,

II. PAST HISTORY
Previous Injuries _____
Previous Back Pain _____
Illnesses _____
Operations _____
Medication(s) _____
Other Physicians _____
Known Abnormalities _____

III. PHYSICAL EXAMINATION RIGHT/LEFT

1. VITAL SIGNS:
   Brachial Blood Pressure: Rt. ____/____ Lt. ____/____ Pulse ____ Respirations ____
   Height ____ Weight ____ EENT ____ Heart Sounds ____
2. OBSERVATION:
   Posture ____ Gait ____
   Spinal Asymmetry ____
   Prominence ____
   Flattening ____
   Elevation ____
   Depression ____
   Spinal Rotation Cerv ____ Dors ____ Lum ____
   Scoliosis Cerv ____ Dors ____ Lum ____
   AP Curvature Cerv ____N/A____ Dors ____N/A____ Lum ____N/A____
   Other ____
3. PALPATION:
   Tenderness Cerv ____ Dors ____ Lum ____ Other ____
   Spasm Cerv ____ Dors ____ Lum ____ Other ____
   Temp Increased ____ Decreased ____
   Moisture Increased ____ Decreased ____
   Indurations ____
   Nodules, Masses, Lymph Nodes ____
4. RANGES OF MOTION: (Goniometric Measurements) (Grades – 1: mild, 2: moderate, 3: severe, 4: very severe)

Motion – Cervical Spine	Degree	Amount of Pain	Location of Pain	
Flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Extension	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Right lateral flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Left lateral flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Right rotation	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Left rotation	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull

Motion – Thoracolumbar Spine	Degree	Amount of Pain	Location of Pain	
Flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Extension	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Right lateral flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Left lateral flexion	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Right rotation	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull
Left rotation	____	Grade 1 - 2 - 3 - 4	____	Sharp/Dull

Joint areas: ____ (a) ____ (b) ____ (c)

P = Pain NP = Painless (given in degrees)

	(a)	(b)	(c)
Flexion	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP
Extension	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP
Abduction	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP
Adduction	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP
External rotation	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP
Internal rotation	NP ____/____ NP	NP ____/____ NP	NP ____/____ NP

5. NEUROLOGICAL: (Deep reflexes graded by Wexler Scale)
   Reflex Status:
   Deep: Biceps ____/____ Triceps ____/____ Radial ____/____
   Ulnar ____/____ Wrist ____/____ Scapulo-humera ____/____
   Patellar ____/____ Hamstring ____/____ Ankle ____/____
   Superficial: P = Present A = Absent
   Upper abdominal ____/____ Lower abdominal ____/____
   Gluteal ____/____ Cremasteric ____/____
   Pathologic: P = Present A = Absent
   Babinski ____/____ Hoffman's ____/____ Gordon ____/____
   Chaddock's ____/____ Oppenheim ____/____ Rossolimo ____/____

Cranial Nerves: N = Normal A = Abnormal

1 -	Smell	N A		8 -	Whisper	N A	Weber	N A	Rinnes	N A
2 -	Vision: central (Far)	N A	(Near) N A	9 -	Gag reflex & taste			N A		
3 -	Light	N A		10 -	Voice, Swallow			N A		
3-4-6 -	Eye Movements	N A		11 -	Shoulder, Shrug			N A		
5 -	Sensation & Wink	N A		12 -	Tongue Movements			N A		
7 -	Smile, Taste, Tongue	N A								

Cerebral Function ____ Cerebellar Function ____

Muscle Strength: (Grades – 5: normal, 4: good, 3: fair, 2: poor, 1: trace, 0: zero)

Cervical Spine

Motion	Muscle Grade
Right flexion	____
Left flexion	____
Right extension	____
Left extension	____
Right lateral flexion	____
Left lateral flexion	____
Right rotation	____
Left rotation	____

Level	Muscle	Muscle Grade
C5	Deltoideus	____/____
C6	Biceps	____/____
	Wrist extensors	____/____
C7	Triceps	____/____
	Wrist flexors	____/____
	Finger extensors	____/____
C8	Finger flexors	____/____
T1	Finger abductors	____/____

Thoracolumbar Spine

Motion	Muscle Grade
Right flexion	____
Left flexion	____
Right extension	____
Left extension	____
Right lateral flexion	____
Left lateral flexion	____
Right rotation	____
Left rotation	____

Level	Muscle	Muscle Grade
L2-3	Hip flexors	____/____
L4-5	Hip extensors	____/____
L3-4	Knee extensors	____/____
L5-S1	Knee flexors	____/____
L4-5	Ankle extensors	____/____
S1-2	Ankle flexors	____/____

Muscle Testing via ____ Hand Dynamometer: Patient is right/left handed
Right hand: 1st ____ lbs. 2nd ____ lbs. 3rd ____ lbs.
Left hand: 1st ____ lbs. 2nd ____ lbs. 3rd ____ lbs.

Measurements – Circumferential:
Chest: Expiration ____ " Inspiration ____ "
Upper Limbs:
Brachium: 4" from upper pole of olecronon: Right ____ " Left ____ "
Antebrachium: 4" from lower pole of olecronon: Right ____ " Left ____ "
Lower Limbs:
Thigh: 6" from upper patellar pole: Right ____ " Left ____ "
Calf: 6" from lower patellar pole: Right ____ " Left ____ "
Leg Lengths:
Standing: From greater trochanteric apex to floor: Right ____ " Left ____ "
Supine: From A.S.I.S. to apex of internal malleolus: Right ____ " Left ____ "

Sensation: Right/Left P = Present A = Absent D = Decreased

Area/Dermatome	Sensation	(a)	(b)	(c)	(d)	(e)
a) ____	Light touch	____/____	____/____	____/____	____/____	____/____
b) ____	Pinprick	____/____	____/____	____/____	____/____	____/____
c) ____	Vibration	____/____	____/____	____/____	____/____	____/____
d) ____	Warm/Hot	____/____	____/____	____/____	____/____	____/____
e) ____	Cool/Cold	____/____	____/____	____/____	____/____	____/____

5. ORTHOPEDIC TESTS/SIGNS: P = Positive/Present N = Negative/Absent

Dejerine Triad + – IN C T L (For disc occlusion)

A. Cervical
1. Distraction ____/____ nerve root compression
2. Max. Cer. Rot. Comp. ____/____ nerve root compression
3. Soto-Hall ____/____ vertebral trauma

B. Cervical-Brachial
1. Adson/Scalene ____/____ neurovascular comp.
2. Costoclavicular ____/____ neurovascular comp.
3. Wright's ____/____ neurovascular comp.

C. Shoulder
1. Coracoid press ____/____ coracoid pressure syndrome
2. Duges ____/____ dislocation
3. Supraspinatus ____/____ rotator cuff tear

D. Thoracolumbar
1. Dbl. leg raise ____/____ lumbo sacral
2. Ely ____/____ upper lumbar
3. Lasague sitting ____/____ muscle, disc, nerve irritation
4. Fajersztajn ____/____ intervertebral disc syndrome
5. Lindner's ____/____ nerve root compression

E. Compensatory Pain
1. Burn's bench ____/____ malingering
2. Hoover's ____/____ malingering
3. Libman's L N H pain threshold

Minor's Sign P A (For radicular disc pain)

F. Sacro-iliac
1. Abduction stress ____/____ sacroiliac lesion
2. Gaenslens ____/____ sacroiliac lesion
3. Iliac compression ____/____ sacroiliac lesion

G. Radiculitis/Neuralgia
1. Bechterew ____/____ sciatic compression
2. Lasegue Test ____/____ sciatic compression
3. Braggard ____/____ sciatic irritation
4. Ely ____/____ femoral irritation

H. Hip
1. Allis ____/____ femoral displacement
2. Gauvain's ____/____ hip pathology
3. Laguerre ____/____ hip muscle spasm
4. Patrick ____/____ hip myo spasm, lumbar strain

I. Knee
1. Anterior draw ____/____ ant. cruciate lig.
2. Posterior draw ____/____ post. cruciate lig.
3. Apley ____/____ dis./comp. collateral/cartilage
4. McMurray ____/____ med./lat. med./lat. meniscus

J. Elbow
1. Mills ____/____ radiohumeral epicondylitis
2. Kaplan's ____/____ extra artic

Additional tests, findings and remarks: ____

IV. X-RAY

X-Rays of the _____ (area) _____ (views)
and the _____ (area) _____ (views)
and the _____ (area) _____ (views)
and the _____ (area) _____ (views)
reveal the following:

1. Bone Deformities: _____
2. Irregularity of Articular Surfaces: _____
3. Sclerotic Changes: _____
4. Proliferative Changes: _____
5. Decreased Joint Space: _____
6. _____
7. _____
8. _____
9. _____
10. _____

V. DIAGNOSIS:

_____
_____
_____
_____

VI. PROGNOSIS:

_____
_____
_____

RECOMMENDATIONS

Complete rest, no work _____ Weight reduction _____
Increase in rest _____ No smoking _____
Light work only _____ Exercise _____ (specify below)
Cold application 20 min./hr. _____ Lifts _____
Heat application to _____ for _____ min. _____ times daily
Consultation with Dr. _____
Treatment Schedule _____ times per week for _____ weeks
then _____ times per week for _____ weeks
Immobilization/Support _____
Traction application _____
Internal management/Nutrition _____
Special _____
_____
_____

OFFICE MANAGEMENT

Ice _____ Heat _____
CMT _____ (light-normal)
_____
Physiotherapy _____
_____
Electrotherapy _____
_____
Special _____
_____
_____
_____
_____
_____
_____
_____

WORK SHEET FOR NARRATIVE REPORT

Patient's Name_____
Date of Exam:_____

MAIN COMPLAINT(S) AND CURRENT HISTORY

1. What part bothers you most: 2. Describe type of discomfort:
   a)_____ _____
   What next most:
   b)_____ _____
   Next:
   c)_____ _____
   Next:
   d)_____ _____
3. Point to the worst spots: a)_____
   b)_____
   c)_____
   d)_____
4. What makes it worse (aggravates): What makes it better (relieves):
   a) _____ _____
   b)_____ _____
   c)_____ _____
   d)_____ _____
5. Where does it spread: a)_____
   b)_____
   c)_____
   d)_____
6. When (what date) did it start:
   a)_____ b) _____ c)_____
   d)_____ (comments)_____
7. Did it (they) start by: (Check off & use space to describe) Follow-up:
   accident ( ) Hospital? Therapies? Medications? Missed work?
   illness ( )
   insidious( )
   other ( )
8. What does it keep you from doing:
   Because of ? pain ( )
   weakness ( )
   just can't ( )
9. From when it started: Explain
   a) is it better now ( )
   b) worse now ( )
   c) about the same ( )

AUTO ACCIDENT REPORT FORM (1)
(narrative)

Current Date:_____

REPORT OF_____

RE: (name)_____ Date of Exam_____
(address)_____ Requesting_____
_____ (Dr.) (Mr)_____

HISTORY OF PRESENT COMPLAINT (S)

The above alleges (his) (her) present condition is due to (a) (an)_____ accident which took place on (date)_____ at approximately (time)_____(AM) (PM). The patient was (driving) (a passenger)in a (car) (truck) (other)_____ and was seated (in front) (in back) (other)_____ _____. The vehicle with the patient in it was (stopped) (traveling) on (highway) (route) _____ (street) (avenue) (facing) (going) (east) (west) (north) (south) when another vehicle (in back) (in front) (on the right) (on the left) met it in a collision. The vehicle the patient was in(was struck by) (struck) the other (car) (truck) (bus) (other)_____ with the patient's vehicle sustaining damage to the (rear) (front) (right) (left) (side). At the time of the collision the patient was (looking - forward - up - down - to the right - to the left) (bending down) (turning) (to the right) (to the left). Due to the impact the patient was thrown (backward - forward - to the right - to the left) and struck (his) (her) - (give body parts) _____ _____ against the (steering wheel) (dashboard) (other) __ _____ with a resultant (contusion) (cut) (dislocation) of the (anatomical area)_____. The patient (did) (did not) notice immediate pain in the _____region (s). The patient (was) (was not) rendered unconscious. (He) (She) (was) (was not) able to get out and walk from the vehicle unaided. The patient then went (home) (to the hospital) (other) _____ by (own) (another) (ambulance) (police) vehicle where (he) (she) (rested) (was examined) (other) _____ _____ . Patient (did not) (did) stay in confinement and (did not) (did) receive treatment consisting of_____. The patient spent (an) (a) (uneventful) (restless) (painful) night and the following day felt (better) (worse) (the same) experiencing (relief) (pain) (numbness) (aching) in the _____ region (s). The patient (has) (has not) missed work from (date)_____ to (date) _____ in (his) (her) job as (a) (an)_____.
The patient alleges that (his) (her) present complaint (s) (has) (have) (interferred with) (lessened) (eliminated) the ability to do the following:

_____
_____
_____

Previous doctors seen by the patient include:
Dr._____, (date)_____ for_____
Dr. _____, (date)_____ for_____
Dr. _____, (date)_____ for_____

PAST MEDICAL HISTORY
The patient (denies) (admits) previous similar symptoms prior to this accident.
Significant illnesses_____ date_____
_____ date_____
Significant accidents_____ date_____
_____ date_____
Operative procedures_____ date_____
_____ date_____
Medications taken_____ date_____
_____ date_____
Other known abnormalities_____
_____

(2) (narrative form)

SOCIAL HISTORY:
Patient's regular occupation is that of_____
Marital Status:_____
Number of children:_____
Spouse's occupation:_____
Father's health:_____
Mother's health:_____
Smoking: _____daily
Alcohol (yes) (no) type:_____ Frequency:_____

PRESENT COMPLAINT (S) (In order of severity)
1._____
_____
2._____
_____
3._____
_____
4._____
_____
5._____
_____
6._____
7._____
8._____
9._____

(3) (narrative form)

EXAMINATION FINDINGS: Per Main Complaint Area (s)

1) Observation: The patient is a ___ year old (W) (B) (O)_____ (M) (F) who is of (slight) (average) (heavy) stature, standing ___' ___" and weighing ___lbs. with a blood pressure of ____/____ showing (poor) (fair) (good) (excellent) _____ posture and (a normal) (an abnormal) _____ gait.
When asked to point to the centers of maximum discomfort the patient indicated the_____
_____ region (s).
There appeared to be (no) (some) (marked) asymmetry of the (spinal) - (pelvic)-(upper)-(lower)-(trunk)-(extremities) _____region(s) - (area(s) showing: (enlargement)(swelling) of the_____,
prominence of the_____,
flattening of the_____,
elevation of the_____,
depression of the_____ and
_____ of the _____;
There (was)_____(was no) discoloration noted of the_____area(s).
The cervical spine showed: (no)(right)(left) rotation and (no)(right)(left) leaning with (a)(an) (increased)(decreased)(normal appearing)lordosis.
The dorsal spine showed: (no)(right)(left) rotation and (no)(right)(left) leaning with (a)(an) (increased)(decreased)(normal appearing) kyphosis.
The lumbar spine showed:(no)(right)(left) rotation and (no)(right)(left) leaning with (a)(an) (increased)(decreased)(normal appearing) lordosis in the _____ position (s).
Pelvic inclination was (increased) (decreased) (normal).
Cutaneous eruptions (were) (were not) noted over_____.
Also noted was_____.

2) Palpation:
Significant tenderness was elicited over: Cervical spinous processes_____, Thoracic spinous processes_____, Lumbar spinous processes_____, Sacral levels_____, the (right)-(left) posterior superior iliac spine areas, the (right)(left) (upper)(lower) gluteal area(s), the paraspinal musculature of the (right)-(left) (upper)-(middle)-(lower) cervical region, the (right)-(left) (upper)-(middle)-(lower) thoracic region, the (right)-(left) (upper)-(lower) lumbar region and the _____ of the_____ region(s).
There (was) (no) (muscle spasm)-(muscle tightness) noted of the_____
_____ area(s).
(Nodules)-(masses) (were) (not) noted in the_____
_____ region(s).
Temperature differences (were) (not) revealed of _____
_____.
Moisture differences (were) (not) revealed of_____
_____.
Areas of induration (were) (not) found in _____
_____.
Also noted was_____
_____.

3) Ranges of Motion: (4) (narrative form)
(Goniometric measurements) Cervical Spine

Motion	Degrees	Amount of Pain	Location of Pain
Flexion			
Extension			
Right lateral flexion			
Left lateral flexion			
Right rotation			
Left rotation			

Dorsolumbar Spine

Motion	Degrees	Amount of Pain	Location of Pain
Flexion			
Extension			
Right lateral flexion			
Left lateral flexion			
Right rotation			
Left rotation			

Joint areas: _____ (a) _____ (b) _____ (c)

P=Pain NP=Painless (given in degrees)

right/left	(a)	(b)	(c)
Flexion	NP___/___NP	NP___/___NP	NP___/___NP
Extension	NP___/___NP	NP___/___NP	NP___/___NP
Abduction	NP___/___NP	NP___/___NP	NP___/___NP
Adduction	NP___/___NP	NP___/___NP	NP___/___NP
External rotation	NP___/___NP	NP___/___NP	NP___/___NP
Internal rotation	NP___/___NP	NP___/___NP	NP___/___NP

4) Neurological:
Reflex Status: right/left (deep reflexes graded by Wexler Scale)
Deep: Biceps___/___ Triceps___/___ Radial___/___
Ulnar___/___ Wrist___/___ Scapulo-humeral___/___
Patellar___/___ Hamstring___/___ Ankle___/___
Superficial: P=Present A=Absent
Upper abdominal___/___ Lower abdominal___/___
Gluteal___/___ Cremasteric___/___
Pathologic: P=Present A=Absent
Babinski___/___ Hoffman's___/___ Gordon___/___
Chaddock's___/___ Oppenheim___/___ Rossolimo___/___

Muscle strength: 5=normal 4=good 3=fair 2=poor 1=trace 0=zero

Joint	right/left (a)	(b)	(c)	(d)
a_____ Flexion				
b_____ Extension				
c_____ Abduction				
d_____ Adduction				
External rotation				
Internal rotation				

4) Neurological: Grades= 5=normal 4=good 3=fair 2=poor 1=trace 0=zero

Muscle strength:

Cervical Spine (intrinsic)

Motion	Muscle grade	Impairment %	True weakness	Reason
Right Flexion				
Left Flexion				
Right Extension				
Left Extension				
Right lateral flexion				
Left lateral flexion				
Right rotation				
Left rotation				

Muscle Testing via Neurological levels: (right/left)

Level	Muscle	Muscle grade	Impairment %	True weakness	Reason
C5	Deltoideus	/			
C6	Biceps	/			
	Wrist extensors	/			
C7	Triceps	/			
	Wrist flexors	/			
	Finger extensors	/			
C8	Finger flexors	/			
T1	Finger abductors	/			

Dorsolumbar Spine (intrinsic)

Motion	Muscle grade	Impairment %	True weakness	Reason
Flexion				
Extension				
Right lateral flexion				
Left lateral flexion				
Right rotation				
Left rotation				

Muscle Testing via Neurological levels: (right/left)

Levels	Muscles	Muscle grade	Impairment %	True weakness	Reason
L2-3	Hip flexors	/			
L4-5	Hip extensors	/			
L3-4	Knee extensors	/			
L5-S1	Knee flexors	/			
L4-5	Ankle extensors	/			
S1-2	Ankle flexors	/			

Muscle Testing via Hand Dynamometer: Patient is (right/left) handed

Right hand: 1st_____lbs. 2nd_____lbs. 3rd_____lbs.

Left hand : 1st_____lbs. 2nd_____lbs. 3rd_____lbs.

Measurements - Circumferential:

Chest: Expiration_____" Inspiration_____"

Upper Limbs:

Brachium: ____" from upper pole of olecronon: Right____" Left____"

Antebrachium: ____" from lower pole of olecronon: Right____" Left____"

Lower Limbs:

Thigh: ____" from upper patellar pole: Right____" Left____"

Calf: ____" from lower patellar pole: Right____" Left____"

Leg lengths:

Standing: From greater trochanteric apex to floor: Right____" Left____"

Supine: From A.S.I.S. to apex of internal malleolus: Right____" Left____"

4) Neurological:

Sensation: (right/left) P=Present A=Absent

Area/Dermatome	Sensation	(a)	(b)	(c)	(d)	(e)
a)_____	Light touch	/	/	/	/	/
b)_____	Pinprick	/	/	/	/	/
c)_____	Vibration	/	/	/	/	/
d)_____	Warm/Hot	/	/	/	/	/
e)_____	Cool/Cold	/	/	/	/	/

Special Neurological Examinations For: (check off)

General Cerebral Function:

Specific Cerebral Function:

Coordination Disturbance (Cerebellum vs. Posterior Columns)

Cranial Nerves:

Motor System (Specific):

Sensory System (Specific):

Specific Cervical Nerves:

Specific Thoracic Nerves:

Specific Lumbar Nerves:

5) X-RAY:

X-rays of the_____ (area) _____ (views)

and the _____ (area) _____ (views)

and the _____ (area) _____ (views)

and the _____ (area) _____ (views)

reveal the following:

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

6) ORTHOPAEDIC TESTS/SIGNS:

Noted in (history) (consultation):
Dejerine triad (positive) (negative) for disk occlusion.
Minor's sign (positive) (negative) for radicular disk pain.

Cervical:

Distraction (positive) (negative) for (right) (left) nerve root compression.
Jackson (positive) (negative) for (right) (left) nerve root compression.
Libman (positive) (negative) for (low) (normal) (high) pain threshold.
Maximum cervical rotary compression (positive) (negative) for nerve root compression.
Neck compression (positive) (negative) for (right) (left) nerve compression.
Soto-Hall (positive) (negative) for (cervical) (dorsal) vertebral trauma.
Valsalva (positive) (negative) for disk occlusion.

Cervical-Brachial: (rt:right) (lt:left)

Adson/Scalene (positive) (negative) for (rt) (lt) neurovascular compression.
Allen (positive) (negative) for (rt) (lt) (radial)(ulnar) arterial occlusion.
Active costoclavicular (positive)(negative) for (rt)(lt) neurovascular compression.
Passive costoclavicular (positive)(negative) for (rt) (lt) neurovascular compression.
Wright (positive) (negative) for (rt) (lt) neurovascular compression.

Shoulder: (rt:right) (lt:left)

Abduction/arch (positive)(negative) for (rt)(lt) rotator cuff tear.
Coracoid press (positive)(negative) for (rt)(lt) coracoid pressure syndrome.
Dugas (positive) (negative) for (rt) (lt) (dislocation) (separation)
Supraspinatus press (positive)(negative) for (rt)(lt) rotator cuff tear.
Yergason (positive) (negative) for (rt)(lt) biceps tendon lesion.

Dorsolumbar: (rt:right) (lt:left)

Adam's sign (positive) (negative) (rt) (lt) intervertebral disk syndrome.
Bechterew (positive)(negative)(rt)(lt) sciatic disk compression.
Beevor's (positive) (negative) (rt) (lt) abdominal muscle weakness.
Double leg raise (positive)(negative) for lumbosacral lesion.
Ely (positive) (negative) (rt) (lt) upper lumbar lesion.
Fajersztajn (positive)(negative) (rt)(lt) intervertebral disk syndrome.
Nachlas (positive)(negative) (rt) (lt) upper lumbar lesion.
Gluteal punch (positive) (negative) (rt) (lt) spinal lesion.
Goldthwaite (positive) (negative) (rt) (lt) lumbar differentiation.
Heel walk (positive) (negative) (rt) (lt) 5th lumbar motor deficit.
Kemps (positive) (negative) (rt) (lt) intervertebral disk rupture.
Lasague (positive)(negative) (rt)(lt) (muscle) (disk) (nerve) irritation.
Lasague rebound (positive)(negative)(rt)(lt) lumbar antalgic spasm.
Lewin standing (positive) (negative) (rt) (lt) tight hamstrings.
Lewin supine (positive) (negative) (rt) (lt) spinal arthritic fixation.
Lindner's (positive) (negative) (rt) (lt) low back nerve root compression.
Neri bowing (positive) (negative) (rt) (lt) tight hamstrings.
Sicard's (positive) (negative) (rt) (lt) 5th lumbar motor nerve palsy.
Supported Adam's (positive)(negative)(rt)(lt) lumbosacral differentiation.

Compensatory Pain:

Libman's (positive)(negative) for (low) (normal) (high) pain threshold.
Burn's bench (positive)(negative) for (hysteria) (malingering)
Hoover's (positive) (negative) for (hysterical paralysis) (malingering)
McBride's toe to mouth (positive)(negative) for malingering.

6) ORTHOPAEDIC TESTS/SIGNS

Sacro-Iliac:

Abduction stress (positive) (negative) for sacroiliac lesion.
Anterior innominate (positive)(negative) (rt)(lt) sacroiliac subluxation.
Beery's (positive) (negative) for pelvic lesion.
Gaenslen (positive) (negative) for (rt) (lt) sacroiliac lesion.
Hibbs (positive) (negative)for (rt) (lt) sacroiliac lesion.
Iliac compression (positive) (negative) for sacroiliac lesion.
Mennell (positive) (negative) for (rt) (lt) sacroiliac ligament strain.
Supported Adam's (positive)(negative) (rt) (lt) pelvic differentiation.

Radiculitis/Neuralgia:

Bechterew (positive)(negative) for (rt) (lt) sciatic compression.
Braggard (positive) (negative) for (rt) (lt) sciatic irritation.
Brudzinski (positive) (negative) for meningeal irritation.
Ely heel to buttock (positive) (negative) (rt)(lt) femoral irritation.
Fajersztajn (positive) (negative) for (rt) (lt) sciatic disk pressure.
Nachlas (positive) (negative) for (rt) (lt) femoral compression.
Kernig (positive) (negative) for meningeal irritation.
Lasague (positive) (negative) for (rt) (lt) sciatic compression.
Lindner's (positive) (negative) for (rt) (lt) nerve root compression.
Popliteal press (positive) (negative) for (rt) (lt) sciatic irritation.

Hip:

Allis (positive) (negative) for (rt) (lt) femoral displacement.
Ely heel to buttock (positive)(negative) for (rt)(lt) femoral lesion.
Gauvain's (positive) (negative) for (rt) (lt) hip pathology.
Hibbs (positive) (negative) for (rt) (lt) hip lesion.
Laguerre (positive) (negative) for (rt) (lt) hip muscle spasm.
Ober's (positive) (negative) for (rt) (lt) tight tensor fascia lata.
Patrick (positive) (negative) for (rt) (lt) hip muscle spasm/ low back strain.
Thomas (positive) (negative) for (rt) (lt) tight hip flexors.
Trendelenberg (positive) (negative) for (rt) (lt) gluteal insufficiency.

Knee:

Abduction stress (positive)(negative) (rt) (lt) medial collateral lig. strain.
Adduction stress (positive)(negative)(rt)(lt) lateral collateral lig. strain.
Anterior drawer (positive) (negative) (rt) (lt) cruciate ligament (partial) (complete) rupture.
Appley (positive)(negative)(rt)(lt) (medial) (lateral) cartilage displacement.
Appley (positive)(negative)(rt)(lt)(medial)(lateral) collateral lig. strain.
Ballottment (positive)(negative) for (rt) (lt) knee effusion.
Extension bounce (positive) (negative) for (rt)(lt) knee pathology.
McMurray (positive)(negative) (rt)(lt) (medial)(lateral)meniscus tear.
Patellar tap (positive) (negative) for (rt) (lt) knee effusion.
Posterior drawer (positive) (negative) (rt) (lt) cruciate ligament (partial) (complete) rupture.

Elbow:

Mill's (positive)(negative) (rt) (lt) radialhumeral epicondylitis.

Carpal Tunnel Syndrome:

Median nerve hypesthesia (positive) (negative) on the (right) (left).
Tinel's sign (positive) (negative) on the (right) (left).
Phelan's sign (positive) (negative) on the (right) (left).

DIAGNOSIS:

(9) (narrative form)

PROGNOSIS:

The outlook for (a) (an) (rapid) (slow) (uneventful) recovery in the (immediate) (near) (distant) future is (poor) (fair) (good) (excellent) at this time.
The patient's (slow) (rapid) (static) convalescence since the (accident) (last _____ (weeks) (months) would indicate _____ (is) (is not) producing fruitful results and more (intensive) (active) (radical) measures (are) (are not) required.
The subjective complaints, the objective findings, (the pre-existing state), and the past history, in my opinion, are of -

a transient nature and the patient should be able to expect an asymptomatic state under (continued therapy) (conservative management) (the present development) in another _____ to _____ weeks.

an indefinite nature and the degree of change con only be speculative at this time regarding the reversibility of the present condition.

a permanent nature and the patient can expect (little) (some) (partial) resolution as the condition progresses along a chronic course with infrequent acute episodes directly proportional to the patient's activity requiring (palliative) (conservative) treatment at those times.

Extenuating factors complicating the reversibility of the present status include the patient's (age), (weight), (pre-existing state), (attitude toward _____), (emotional state), (environment) and (other)_____ _____(explain?)_____.

It is my (opinion) (recommendation) that the patient -

- patient's present program be continued until maximum recovery has been reached.
- be returned to Dr. _____ for continued treatment until maximum (improvement) (recovery) has been reached.
- be put under the following management program for a period of_____ weeks at which time (an asymptomatic state should be reached) (another evaluation with the inclusion of progress reports be taken and a more positive future outlook be given).
- be returned to Dr._____ for continued treatment for another_____ weeks at which time further evaluation be made.
- has reached maximum medical improvement under conservative management.

(additional discussion)_____

RECOMMENDATIONS: (10) (narrative form)

(Further) (Continued) Therapeutic considerations to include:

Home Management

Complete bed rest with bathroom privileges only.
Cold pack application the first twenty minutes of every hour of discomfort.
Home traction application of _____lbs. to the _____ spine for_____ minutes _____ times daily.
Heat application to the _____ area(s) for _____ minutes _____ times daily.
Frequent rest periods of _____ (minutes) (hours) _____ times daily.
Brief _____ splinting by way of _____ (collar) (bandage)_____
Orthopaedic immobilization to _____ region via_____
Orthopaedic support to the _____region via_____
Exercises (for strength) (for mobility) to_____region(s).
Avoidance of all work for a period of_____ weeks.
Light work duty for a period of_____ weeks
Avoidance of all strenuous activity for the next _____weeks.
Internal management of: calcium: _____mg. daily
ascorbic acid : _____mg. daily
Vitamin B complex:_____MDR. daily
_____:_____(mg.) (MDR.) daily
_____:_____(mg.) (MDR.) daily
Heel lift(s) _____" (right)-(left) lower limb(s).
Sole lift(s) _____" (right)-(left) lower limb(s).
Full lift(s) _____" (right)-(left) lower limb(s).
Proper instruction to good sleeping habits with regard to_____
Proper instruction to good working habits with regard to_____
Weight reduction.
No smoking.

Office Therapy

General mobilization of the _____region(s) by way spinal manipulation.
Reduction of posterior facet subluxations via specific spinal manipulation.
Soft tissue manipulation of the_____region(s).
Postural improvement of the_____region(s).
Electrotherapy: High frequency current to the_____region(s)
Electrotherapy: Medium frequency current to _____region(s)
Electrotherapy: Low voltage current (alternating) stimulative to the_____region(s).
Electrotherapy: Low voltage current (direct) sedative to the _____region(s).
Electrotherapy: Iontophoresis (_____transfer) to the_____region(s).
Physiotherapy: Motorized traction of_____lbs. to the _____region(s).
Physiotherapy: Intersegmental motorized traction to the_____region(s)
Physiotherapy: Suction massage to the_____region(s).
Laboratory Diagnosis consisting of the following tests:
a) Urine:_____
b) Blood Chemistry:_____
c) Other:_____
Specialized examination to determine_____
Re-evaluation:
Prophylaxis:

Sincerely,

J. M. Mazion, D.C., D.A.B.C.O.

SPINAL IMPAIRMENT RATING

		Whole Man Impairment
1.	Vertebral Fractures: Bodies Involved ( ) ( ) ( ) ( ) % of Compression ( ) ( ) ( ) ( )	
	a) compression: ( ) ( ) ( ) ( )	
	b) non-union ( ) ( ) ( ) ( ) Types: _____	
	_____	
2.	Reduced Subluxations: (Designate Segments)	
	by Macnab's Line (AP) ( ) ( ) ( ) ( ) ( ) ( ) ( )	
	by Macnab's Line (Lat.) ( ) ( ) ( ) ( ) ( ) ( ) ( )	
	by Hadley's curve (Oblique) ( ) ( ) ( ) ( ) ( ) ( )	
3.	Clinically established disc derangement:	

Diagnostic Test	Pos/Neg	Disc	Residual(s)	
_____	_____	____	_____	____
_____	_____	____	_____	____
_____	_____	____	_____	____
_____	_____	____	_____	____
_____	_____	____	_____	____

4. Vertebral Ankylosis: (favorable) Vertebral Ankylosis: (unfavorable)

Cervical	1 2 3 4 5 6 7	1 2 3 4 5 6 7	____
Dorsal	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	____
Lumbar	1 2 3 4 5	1 2 3 4 5	____

5. Ranges of Motion: (Goniometric Measurements given in degrees)

Cervical Spine	Patient Movement	Normal	Limitation	From "0"	
Flexion	_____	____	_____	____	____
Extension	_____	____	_____	____	____
Right Lat. Flexion	_____	____	_____	____	____
Left Lat. Flexion	_____	____	_____	____	____
Right Rotation	_____	____	_____	____	____
Left Rotation	_____	____	_____	____	____
Dorsolumbar Spine					
Flexion	_____	____	_____	____	____
Extension	_____	____	_____	____	____
Right Lat. Flexion	_____	____	_____	____	____
Left Lat. Flexion	_____	____	_____	____	____
Right Rotation	_____	____	_____	____	____
Left Rotation	_____	____	_____	____	____

6. Short Leg: Right Left In inches: _____ Due to: _____ ____

7. Spinal Surgery: Yes - No Type: _____ ____

8. Pelvic Fractures: Yes - No Type: _____ ____

9. Other: ____

____C____ ____C____=____C____=____C____=____C____=____ ____

Total Spinal Impairment ____

IMPAIRMENT RATING FOR DISABILITY EVALUATION FORM

RANGE OF MOTION (ROM) EVALUATION: (Given in degrees)

Motion	Patient Movement	Normal	Limitation	Extremity Impairment	Whole Man Impairment
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____
_____	____	____	____	____	____

Compression of vertebral bodies: _____ ____
Non-union of posterior elements: _____ ____
Reduced subluxations: _____ ____
Ankylosis (segments) (joints): _____ ____
Short leg: _____ ____
Other spinal impairments: _____ ____

MOTOR IMPAIRMENT RATING (MIR):

Joint Motion	Innervation	Nerve Value	Muscle Grade	%	% of Impairment Extremity	% of Impairment W. Man
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____

SENSORY IMPAIRMENT RATING (SIR):

Area Involved	Innervation	Nerve Value	Muscle Grade	%	% of Impairment Extremity	% of Impairment W. Man
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____
_____	_____	_____	_____	__	_____	_____

Impairment of Cranial nerves: _____ ____
Impairment of Spinal Cord: _____ ____

Combined value ROM's - upper extremity (ies): ____ converted to whole man ____
Combined value MIR's - upper extremity (ies): ____ converted to whole man ____
Combined value SIR's - upper extremity (ies): ____ converted to whole man ____

Combined value ROM's - lower extremity (ies): ____ converted to whole man ____
Combined value MIR's - lower extremity (ies): ____ converted to whole man ____
Combined value SIR's - lower extremity (ies): ____ converted to whole man ____

Combined value of spinal impairments: _____ ____
Combined value of Central nervous system impairments: _____ ____

COMBINED: ____

FINAL IMPAIRMENT RATING FOR WHOLE MAN ---------- ____

Abdominal Lesions:
- Chapman's T.
- Cope's S.
- Murphy's T.
- Murphy Punch Ts.

Arthritic Disorders:
- Bracelet T.
- Chest Expansion T.
- Forestier's Bowstring S.
- Fouchet's S.

Biceps Lesions:
- Hueter's S.
- Yergason's T.

Cervical Lesions:
- Bakody's S.
- Distraction T.
- Jackson Compression T.
- Maximum Cervical Compression T.
- Shoulder Depression T.
- Soto-Hall T.
- Spurling's T.
- Valsalva M.

Circulatory Disorders:
- Allen T.
- Buerger's T.
- Claudication T.
- Moskowicz' T.
- Perthe's T.
- Pratt's T.

Differential Tests:
- Belt T.
- Demianoff's S.
- Erichsen's S.
- Goldthwait's S.
- Laguerre's S.
- Lasegue Differential S.
- Manual Percussion T.
- Nachlas T.
- Percussion T.
- Smith-Peterson T.

Elbow Lesions:
- Cozen's T.
- Mill's T
- Kaplan's S.

Foot Lesions:
- Anterior Foot Draw S.
- Forefoot Adduction Correction T.
- Hoffa's S.
- Metatarsal T.
- Strunsky's S.
- Thompson's T.

Fractures:
- Dreyer's S.
- Hennequin's S.
- Hoffa's S.
- Hueter's Fracture S.
- Maisonneuve's S.
- Soto-Hall T.

Hamstring Tightness:
- Beery's T.
- Lewin Standing T.
- Neri's Bowing S.
- Tripod S.

Hip Dislocation:
- Allis T.
- Barlow's T.
- Chapple's S.
- Ortolani's S.

Hip Lesions:
- Ely Heel to Buttock T.
- Gauvain's S.
- Hip Abduction Stress T.
- Hyperextension T.
- Laguerre's T.
- Patrick's T.
- Thomas' T.
- Trendelenburg T.

Intervertebral Disk Syndromes:
- Adam's S.
- Astrom Suspension T.
- Bechterew Sitting T.
- Bowstring S.
- Dejerine's S.
- Fajersztajn's T.
- Kemp's T.
- Lasegue Rebound T.
- Lewin Snuff T.
- Milgram's T.
- Naffziger's T.

Knee Disorders:
- Abduction Stress T.
- Adduction Stress T.
- Apley's T.
- Bounce Home T.
- Childress Duck Waddle T.
- Drawer T.
- Dreyer's S.
- External Rotation-Recurvatum T.
- Fouchet's S.
- Knee Flexion Stress T.
- Knee Drop T.
- McIntosh T.

Knee Disorders: continued
- McMurray's S.
- Patellar Tap S.
- Payr's S.
- Q-Angle T.
- Slocum's T.
- Steinmann's S.
- Wilson's S.

Leg Length:
- Actual Leg Length T.
- Apparent Leg Length T.

Lower Limb Disorders:
- Ely's S.
- Hennequin's S.
- Hoffa's S.
- Homan's S.
- Ober's T.
- Phelp's T.
- Strunsky's S.
- Thomas' T.
- Thompson's T.
- Trendelenburg T.
- Metatarsal T.

Lumbar Lesions:
- (see also Intervertebral Disk Lesion:
- Adam's Positions
- Demianoff's S.
- Double Leg Raise
- Duchenne's S.
- Ely Heel to Buttock T.
- Goldthwait's S.
- Hyperextension T.
- Lasegue Differential S.
- Lewin Punch T.
- Nachlas T.
- Smith-Peterson T.

Meningitis:
- Brudzinski's S.
- Kernig's S.

Nerve Root Compression:
- Bowstring S.
- Distraction T.
- Jackson Compression T.
- Lindner's S.
- Maximum Cervical Compression T.
- Valsalva M.

Nervous System Lesions:
- Huntington's S.
- Morquio's S.
- O'Connell's T.
- Thomas' S.

Paralysis:
- Beevor's S.
- Duchenne's S.
- Huntington's S.
- Neri's S.

Pelvic Lesions:
- Belt T.
- Anterior Innominate M.

Sacroiliac Lesions:
- Anterior Innominate T.
- Erichsen's S.
- Gaenslen's T.
- Gillis' T.
- Goldthwait's S.
- Hibb's T.
- Iliac Compression T.
- Laguerre's T.
- Lewin-Gaenslen's T.
- Nachlas T.
- Sacroiliac Resisted Abduction T.
- Sacroiliac Stretch T.
- Smith-Peterson T.
- Yeoman's T.

Sciatic Nerve Lesions:
- Bonnet's S.
- Bragard's S.
- Deyerle's Sciatic Tension T.
- Lasegue T.
- Minor's S.
- Sicard's S.
- Turyn's S.

Shoulder Dislocation:
- Bryant's S.
- Calloway's T.
- Dugas' T.
- Hamilton Ruler T.

Shoulder Lesions:
- Codman's S.
- Dawbarn's S.
- Mazion's Shoulder M.
- Shoulder Compression T.
- Supraspinatus Press T.

CORRELATION OF SIGNS, TESTS and MANEUVERS

Simulated Complaints:
- Burn's Bench T.
- Hoover's S.
- Lasegue Sitting T.
- Magnuson's T.

Soft Tissue Lesions:
- Buttock S.
- Hueter's Fracture S.
- Manual Percussion T.
- Mennell's T.
- Murphy's Punch T.
- Percussion T.
- Thompson's T.

Thoracic Lesions:
- Chest Expansion T.
- Forestier's Bowstring S.
- Lewin Supine T.

Thoracic Outlet Syndromes:
- Adson's T.
- Allen's T.
- Costoclavicular M.
- Wright's T.

Upper Limb Lesions:
- Bunnel-Littler T.
- Finklestein's T.
- Finsterer's S.
- Maisonneuve's S.
- Yergason's T.
- Teres' T.

Wrist Lesions:
- Bracelet T.
- Finklestein's T.
- Finsterer's T.
- Maisonneuve's S.

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Sign: S. Test: T. Maneuver: M.